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PHASE 1A ARCHAEOLOGICAL DOCUMENTARY STUDY

LOWER MANHATTAN DEVELOPMENT CORPORATION FULTON STREET REDEVELOPMENT PROJECT STREET IMPROVEMENTS MANHATTAN, NEW YORK

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FULTON STREET REDEVELOPMENT PROJECT
STREET IMPROVEMENTS
MANHATTAN, NEW YORK

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EXECUTIVE SUMMARY

The City of New York proposes to enhance Fulton and Nassau Streets Street and their environs into a vibrant retail corridor serving the surrounding commercial and residential sectors as well as the burgeoning visitor market. As the proposed project is necessary to the continued revitalization of Lower Manhattan, the Lower Manhattan Development Corporation (LMDC) would provide a portion of the funding. The core components of the proposed project include improvements to the streetscape and to the storefronts and facades of buildings that contribute to the heritage and experience of the corridor, as well as the creation, expansion or improvement of open space within the project area.

The proposed project centers on the Fulton Street Corridor (Corridor). Based on the most current design plans for the Corridor, there are five (5) areas within the project bounds that must be evaluated for potential archaeological resources. These include two areas of proposed open space, a park, and a playground. The fifth location is the Corridor Streetbeds, including portions of Fulton, John, Pearl, Cliff, Gold, William, and Nassau Streets. This report addresses solely the archaeological potential of the streetbeds.

The proposed project requires review under the National Environmental Policy Act (NEPA), the State Environmental Quality Review Act (SEQRA), and New York City Environmental Quality Review (CEQR), all of which require the consideration of potential impacts to historic resources. In addition, potential effects on historic resources are considered in conformance with Section 106 of the National Historic Preservation Act of 1966 (NHPA) and the New York State Historic Preservation Act of 1980 (SHPA). The New York City Landmarks Preservation Commission (LPC) *Guidelines for Archaeological Work in New York City* outlines specific steps to determine whether a proposed action could affect areas of potential archaeological sensitivity. The Area of Potential Effect (APE) for the Corridor Streetbeds is defined as the portion of the Corridor project site that will experience subsurface impacts that may disturb areas of potential archaeological sensitivity.

The Corridor Streetbeds APE has experienced extensive subsurface disturbance in many locations. Prior archaeological studies undertaken for projects in the immediate vicinity, including a portion of the Corridor Streetbeds APE, have concluded that there is extensive disturbance to much of the study area. Based on these prior studies and a review of the documentary literature, it is estimated that roughly the upper three feet in the APE have been disturbed by multiple episodes of road regulating, paving, utility installation, and development. Furthermore, three subway lines run through the APE and in specific locations have eradicated the potential for any archaeological resources.

Research has concluded that there is minimal potential for precontact archaeological resources in the APE, and if precontact deposits do exist in discrete locations, they would be found where historical fill may have protected them from later disturbance. Specifically, it is possible that precontact resources may be found beneath roughly seven feet of fill at the intersection of Pearl and Fulton Streets, and beneath roughly five-and-a-half feet of fill near the intersection of Gold and Beekman Streets The APE was also found to be potentially sensitive for historical archaeological deposits in specific locations, and these deposits may include historical fill, fill retaining devices, wharves, domestic features (e.g., wells, cisterns, and privies), infrastructure features (e.g., wood water pipes, pumps, street cisterns, and municipal wells), and structural features (e.g., sidewalk vaults and building footprints).

If the proposed project will cause disturbance of three or more feet below grade where the APE has been designated as sensitive for historical archaeological deposits, or more than five to seven feet below grade where it has been designated as sensitive for precontact archaeological deposits, the proposed project may affect potential archaeological deposits. If these impacts cannot be avoided, then an archaeological field testing program should be designed in coordination with the State Historic Preservation Office (SHPO) and LPC.

TABLE OF CONTENTS

TABLES

FIGURES

PHOTOGRAPHS

1. Fulton Street at Pearl Street, facing east toward the Pearl Street Playground.
2. Fulton Street, facing northeast from the south side of Pearl Street.
3. Fulton Street between Pearl and Cliff Streets, facing east.
4. Fulton Street between Cliff and Gold Streets, facing east.
5. Fulton Street at William Street, facing northeast up William Street.
6. Fulton Street at Nassau Street, facing northeast up Nassau Street.
7. Fulton Street and Broadway intersection, facing northeast up Broadway.
8. Fulton Street and Church Street intersection, facing southeast to St. Paul's cemetery.
9. Construction along west side of Fulton Street, south of Broadway, in connection with the Fulton Street Transit Center project.
10. John Street, facing north up the former route of Burling Slip from South Street.
11. John Street, facing northeast from Pearl Street.
12. John Street, facing north from Cliff Street.
13. John Street, facing north from William Street.
14. Pearl Street facing east from Maiden Lane.
15. Cliff Street at John Street, facing east.
16. William Street at Fulton Street, facing east.
17. Nassau Street at Fulton Street, facing east.
18. Utility work in Platt Street at Pearl Street, out of APE.

INTRODUCTION

The City of New York proposes to enhance Fulton and Nassau Streets Street and their environs into a vibrant retail corridor serving the surrounding commercial and residential sectors as well as the burgeoning visitor market. As the proposed project is necessary to the continued revitalization of Lower Manhattan, the Lower Manhattan Development Corporation (LMDC) would provide a portion of the funding. The core components of the proposed project include improvements to the streetscape and to the storefronts and facades of buildings that contribute to the heritage and experience of the corridor, as well as the creation, expansion or improvement of open space within the project area.

The proposed project centers on the Fulton Street Corridor (Corridor), which includes Fulton Street bounded by Church Street to the west and Water Street to the east; and streets intersecting Fulton Street up to a three block area north and south (Figures 1, 2). Based on the most current design plans for the Corridor, there are five (5) areas within the project bounds that must be evaluated for potential archaeological resources. These include two areas of proposed open space, a park, and a playground (Figure 2). The fifth location is the Corridor Streetbeds, the topic of this report (Figure 3; Photographs 1-18).

The proposed project requires review under the National Environmental Policy Act (NEPA), the State Environmental Quality Review Act (SEQRA), and New York City Environmental Quality Review (CEQR), all of which require the consideration of potential impacts to historic resources. In addition, potential effects on historic resources are considered in conformance with Section 106 of the National Historic Preservation Act of 1966 (NHPA) and the New York State Historic Preservation Act of 1980 (SHPA). The New York City Landmarks Preservation Commission (LPC) *Guidelines for Archaeological Work in New York City* (2002) outlines specific steps to determine whether a proposed action could affect areas of potential archaeological sensitivity. The first step in this process is an initial review of the affected area, in this case the Corridor, to define the Area of Potential Effect (APE). Since this report is to be reviewed by both the New York State Historic Preservation Office (SHPO) and the LPC, this first step, normally undertaken by LPC, has been completed by Historical Perspectives, Inc. The APE is defined as the portion of the Corridor that will experience subsurface impacts that may disturb areas of potential archaeological sensitivity. Once the APE has been defined, an Archaeological Documentary Study – frequently referred to as a Phase 1A Study – must be undertaken to establish the potential effects of the project on potential archaeological resources.

RESEARCH GOALS AND METHODS

This Archaeological Documentary Study, as clarified by the LPC guidelines (2002), addresses only those land areas within the proposed Corridor that will be subject to direct construction activities, which is defined as the APE. As noted above, this study addresses solely one portion of the APE: the Corridor Streetbeds. For the entirety of this report, the Corridor Streetbeds APE will be defined to include both streetbeds (or roadbeds) and adjoining sidewalks, from building line to building line, unless otherwise indicated. The APE includes the following locations:

- Fulton Street between Water Street and Church Street;

- John Street between South Street and William Street;
- Pearl Street between Maiden Lane and Fulton Street;
- Cliff Street between John Street and Fulton Street;
- Gold Street between John Street and Beekman Street;
- William Street between Maiden Lane and Beekman Street; and,
- Nassau Street between Maiden Lane and Spruce Street.

In order to address the archaeological potential of the Corridor Streetbeds APE, sufficient information was gathered to assess the subsurface disturbance record, both horizontally and vertically, and to establish the potential for precontact period and historical archaeological resources. Prior archaeological studies and surveys that were undertaken for areas either within or directly adjacent to the Corridor Streetbeds APE provided an invaluable data base from which to complete the current assessment.

This documentary study, which also entails a cartographic analysis of the Corridor Streetbeds APE through time, is designed to determine areas of possible precontact and historical archaeological sensitivity as well as areas unlikely to produce archaeological materials due to prior disturbance from the installation of subsurface utilities, grading, paving, and prior construction and demolition cycles, etc.

Historical Perspectives, Inc.'s protocol adheres to a conservative and phased approach. It relies on a series of tasks to identify which – if any – of the Corridor Streetbeds APE parcels would require invasive testing to satisfy the applicable environmental review regulations. These tasks are described below.

Task 1:
Primary source material, which helps to establish a site-specific framework in which to assess the Corridor Streetbeds APE, was reviewed to identify historic land use through time. This includes reviewing the Minutes of the Common Council, conveyance records on file at the City Register's Office, tax, directory, and census records, where relevant, and Street Improvement maps and Water Lot Grants recorded at the Office of the Manhattan Borough President's Topographical Bureau. Atlases, maps, and other pertinent primary records were also reviewed.

Task 2:
In order to place the Corridor Streetbeds APE in a broader historical context, local and regional histories were reviewed.

Task 3:
Paralleling the research to determine the archaeological and historical sensitivity was research to determine the likelihood that resources are extant, having survived the normal destructive forces of urban development. Historical atlases and Sanborn Fire Insurance Maps were reviewed to establish construction episodes, building heights, and the presence of basements, which are indicators of subsurface disturbance where road and sidewalks now lie over former developed lots. Cartographic comparisons were critical in demonstrating elevation changes over the last 150 years.

Task 4:
Pertinent archaeological reports for the surrounding vicinity were reviewed to establish a comparative framework for potential archaeological resources.

Task 5:
A walkover of the Corridor Streetbeds APE and a photographic record of the current conditions were completed in February 2007. Anomalies and areas of obvious ground disturbance were noted on the site sensitivity map.

CORRIDOR STREETBEDS SITE LOCATIONS AND CONDITIONS

Site Location: The Corridor Streetbeds APE is generally located between South Street to the south, Church Street to the north, Maiden Lane to the west, and Spruce Street to the east (Figures 1 through 3). More specifically, the APE includes:

- Fulton Street between Water Street and Church Street;
- John Street between South Street and William Street;
- Pearl Street between Maiden Lane and Fulton Street;
- Cliff Street between John Street and Fulton Street;
- Gold Street between John Street and Beekman Street;
- William Street between Maiden Lane and Beekman Street; and,
- Nassau Street between Maiden Lane and Spruce Street.

The existing building line is consistently used as the outer boundary of the APE along each of the above streets (Figure 3).

Predevelopment Conditions: The precontact and historical development of Lower Manhattan have been influenced, in part, by topographic and ecological conditions. Establishing the project site's geological and ecological history is a necessary step toward understanding land-use history.

Manhattan Island lies within the Hudson Valley region and is considered to be part of the New England Upland Physiographic Province (Schuberth 1968:10). The underlying geology, much like that of the Bronx and lower Westchester County, is made up of "gneiss and mica schist with heavy, intercalated beds of coarse grained, dolomitic marble and thinner layer of serpentine" (Scharf 1886:6-7). During the three known glacial periods, ice was sometimes as thick as 1,000 feet over Manhattan. Advancing and retreating glaciers carved, scraped, and eroded the land surface in the Northeast. With the final retreat during the Post-Pleistocene roughly 11,500 years Before Present (B.P.), glacial debris, a mix of sand, gravel, and clay, formed the many low hills or moraines that constitute the present topography of the New York City area. Along these low hills many rivers, streams, lakes, and ponds were formed. The constant flow of these rivers and streams as well as the corresponding rise in sea level continued to mold the landscape. Manhattan, a low-lying island marked by hills, is surrounded by rivers and a large, protected, deep water bay, and was formed following the last of the three glacial periods.

The project site falls within the embayed section of the Coastal Plain, which extends along the Atlantic Coast and ranges from 100 to 200 miles wide. The Manhattan prong, which includes southwestern Connecticut, Westchester County, and New York City, is a small eastern projection of the New England uplands, characterized by 360-million-year-old, highly metamorphosed bedrock (Schuberth 1968:11). The Manhattan ridge generally rises in elevation toward the north, and sinks toward the south. South of 30th Street, the bedrock dips down several feet beneath the earth's surface, and south of Washington Square Park it plunges down below 100 feet, forming a subterranean valley.

The prevalent gneissoid formation underlying the project site is Hudson River metamorphosed rock. Manhattan is characterized by a group of gneissoid islands, separated from each other by depressions which are slightly elevated above tide and filled with drift and alluvium. The area consists of drift with underlying crystalline rocks including stratified gneiss, mica schist, hornblendic gneiss, and hornblende schist with some feldspar and quartz (Gratacap 1909:27).

Historical development has altered many of the natural topographic features that once characterized Manhattan, including the early historic shoreline (Gratacap 1909:5). During the late precontact and early historical periods, portions of the APE were submerged under the East River and the coastline staggered between present day Pearl and Water Streets. What are now John and Fulton Streets south of Pearl Street was once in the East River. In the early 17th century, the high and lower water marks of the East River were between Pearl and Water Streets (Viele 1865; *RD 352. Registers Office* 1917; Innes 1902; Cartwitham 1740; Lyne 1730; Grim 1813; Sanborn 2005; Figures 4, and 7 through 11). Later this area was filled and developed.

Current Conditions and Prior Disturbances: The current conditions in the Corridor Streetbeds APE vary, and are a direct result of the historical development. The streets and sidewalks in the APE are open to pedestrian and vehicular traffic, although there are several infrastructure improvements currently in progress in Lower Manhattan that impede passage in specific locations (Figures 5 and 6; Photographs 1-18).

There are three subway lines currently located beneath several roadbeds in the Corridor Streetbeds APE (Figure 4):

- The 4th Avenue BMT line (ca.1931) that runs beneath the entire Nassau Street portion of the APE;
- The 8th Avenue IND line (ca.1931) that runs beneath Fulton Street for the entire length of the APE; and,
- The 7th Avenue IRT line (ca. 1918) that runs beneath William Street for the entire length of the APE.

The 8th Avenue IND line runs beneath Fulton Street and is also referred to as the Fulton Street/Cranberry Tunnel. The line here is a twin tube tunnel that was built largely by shield tunneling under compressed air. After the tunnels were driven, the Broadway and Nassau Street station and mezzanines were built by cut-and-cover excavation, opening up the previously built tunnel. The Fulton Street/Cranberry tunnel passes under the 4th Avenue BMT Fulton/Nassau Street station, and the 7th Avenue IRT Fulton/William Street station. The portion of the Fulton/Nassau Street station over the Broadway/Nassau Street station was built under the 8th Avenue IND Fulton/Cranberry Tunnel contract. The 4th Avenue BMT Nassau Street line is an extension of the part of the BMT Centre Street loop and was the last section of the Dual system to be completed (1931). Because of the narrowness of Nassau Street, it has a split profile at Fulton Street, the Broadway/Nassau Street platform being constructed over the southbound track. It was built by the cut-and-cover method, as was the IRT William Street subway, and opened in 1933 (personal communication, Robert Olmsted, Transportation Consultant, March 5, 2007).

In addition to the tunnels, there are also stations, pedestrian entrances and egresses, vent shafts, and utility conduits associated with the subways. The methods of construction of the tunnels and stations varied, resulting in different levels of impacts to the APE. Cut-and-cover construction, which would have eradicated all potential resources, was employed for both the 4th Avenue BMT line and the 7th Avenue IRT line. Likewise, where additional excavations were undertaken beneath sidewalks for stations and vent shafts at the intersections of Nassau and Fulton Streets and Fulton Street and Broadway, subsurface disturbance is also extensive. The following is a summary of subsurface disturbance in the APE caused by subway construction (see Figure 4 for locations):

- William Street – street is completely disturbed, while areas beneath adjacent sidewalks may have been left undisturbed.
- Nassau Street – street is completely disturbed, while areas beneath adjacent sidewalks may have been left undisturbed.
- Intersection of Nassau and Fulton Streets – completely disturbed.
- Intersection of Fulton Street and Broadway – completely disturbed.
- Fulton Street between William Street and Broadway – completely disturbed

Only portions of the 8th Avenue IND line beneath Fulton Street south of William Street have probably not disturbed the Corridor Streetbeds APE, having been constructed by boring at about 20' below existing grade (Hall 1945:8). This action would not have disturbed this section of the APE.

There are several active infrastructure improvement projects in Lower Manhattan that have had or will have an effect on the subsurface conditions of portions of the APE. These include improvements to the subsurface transit facilities and utilities as part of the Fulton Street Transit Center (FSTC) project in conjunction with the rebuilding efforts at the World Trade Center Memorial site; water main improvements associated with the Wall Street Area Water Main Project (NYC Department of Design and Construction [DDC] Contract No.MED-583AR); and the New York City Department of Transportation [NYCDOT] Post-9/11 Emergency Roadway Reconstruction program.

The FSTC project is a massive restructuring of the underground transit systems that merge in the vicinity of Fulton Street and Broadway, incorporating six existing Lower Manhattan subway stations. Sections of the FSTC project APE overlap the current Corridor Streetbeds APE (Figure 5). These areas include:

- Fulton Street from just south of William Street north to Broadway;
- William Street from John Street to Anne Street; and,
- John Street directly south of William Street.

Work is currently underway on the project, and entails improvements to stations and tunnels within the Corridor Streetbeds APE (see Photograph 9).

The cultural resources study for the FSTC APE identified known prior disturbances caused by the installation of utilities, sidewalk vaults, subways, subway vents and shafts, and other subway-

related features (Figure 5). A series of test trenches undertaken for investigation purposes found that utilities in the FSTC APE, including areas that overlap the current Corridor Streetbeds APE, were generally shallow, with the exception of sewer lines, that tended to be deeply buried (see Figure 5 of this report; Berger 2004:7). Water lines were reported down to roughly five feet below grade, with some electrical lines buried as deeply as six feet below grade – although these were more frequently found at shallower depths (less than two feet below grade). Utility lines encountered included water, telephone, electrical, and gas. Based on the information from the test trenches and previous research on utilities in Lower Manhattan (citing Geismar 2003), Berger concluded that the first three feet in depth below ground surface beneath the FSTC APE roadbeds was disturbed (Berger 2004:7). Beneath this, there were specific linear trenches of disturbance where sewer and water lines were buried at depths of between five and twelve feet below grade (Ibid.). Excavations for the installation of these utilities would most probably have extended from one to two feet beyond the diameter of the utility pipe or conduit, both horizontally and vertically.

The Second Avenue Subway archaeological assessment for a portion of Fulton Street at Pearl Street entailed assessing subsurface disturbances (Historical Perspectives, Inc. 2003a: 6.1-APX-96). Utility plans and profiles reviewed for that project indicated that in 1937 subsurface utilities in Fulton Street were located in an area about 20 feet wide in what was then the roadbed (WPA 1937). These included: a 12" water pipe and a 12" high pressure water main; a 4'0" by 4'0" sewer line; a 12" gas pipe; and telephone and electrical ducts. Additional lines merged at intersections. Although there are a vast number of utility lines in this area, in 1937 they were portrayed as being tightly clustered in an approximately 20-foot-wide band in what was the original roadbed of Fulton Street, with no utilities beneath sidewalks (Ibid.).

Recent archaeological monitoring in Lower Manhattan by Alyssa Loorya of Chrysalis Archaeological Consultants – on Beekman Street between Water and Pearl Streets one block east of the Corridor Streetbeds APE – has found that the top two feet of the street corridor has been disturbed by the construction of the roadbed (personal communication, Cece Saunders, September 12, 2006). The FSTC Berger study and Loorya's observations strongly suggest that there are similar depths of prior disturbance in the Fulton Corridor Streetbeds APE: at least two feet below grade has been disturbed by the actual grading, regulating, and paving of the streets; and, at least another one foot below this has been disturbed by the installation of extensive utility networks. Deeper impacts have been caused in specific locations where sewer and water lines were buried.

In addition to the above-identified prior disturbances, new water mains and utilities have recently been installed in portions of the APE to depths of between five and six feet below grade as part of the Wall Street Area Water Main Project, on-going since 1998. Concurrently, the post-9/11 Emergency Roadway Reconstruction program, initiated in response to extensive damage to lower Manhattan Streets caused by the attack on the World Trade Center and subsequent rescue efforts, has disturbed specific locations in the APE as well. The two projects together entail installing new water mains and subsurface utilities, and undertaking road reconstruction or restoration (see Photograph 18). Resurfacing roads, which includes milling and paving them, has occurred in specific locations with impacts extending between 18" and 24" below grade. Where road reconstruction has been undertaken, which includes ripping up and reconstructing the

streets in their entirety as well as replacing underground utility lines, impacts have occurred to roughly five to six feet below grade.

According to the lowermanhattan.info website that provides updates on construction in Lower Manhattan in conjunction with the LMDC (site accessed February 27, 2007), William Street, with its many utility lines located just below the pavement, called for much more extensive restoration than most water main replacements, which typically only require the opening of a five-foot-wide trench in the street. Other streets in the Corridor Streetbeds APE also experienced recent impacts as a result of the water main and reconstruction projects (Joshua Kraus, NYCDOT, personal communication to Anne Locke, August 10, 2006; see Figure 6):

- John Street between South Street and Water Street (milling and resurfacing – impacts between 18-24" below grade)
- John Street between Pearl Street and William Street (full reconstruction – impacts 5-6' below grade);
- Pearl Street between Maiden and John Streets (milling and resurfacing – impacts 18-24" below grade);
- Cliff Street between John Street and Fulton Street (full reconstruction – impacts 5-6' below grade);
- Gold Street between John Street and Beekman Street (milling and resurfacing – impacts 18-24" below grade); and,
- William Street between Maiden Lane and Beekman Street (full reconstruction – impacts 5-6' below grade).

Further impacts to the streetbeds and adjacent sidewalks in the APE have occurred where there was known grading and changes to the original (predevelopment) topography. South of Pearl Street the APE was historically in the East River, and the elevations observed today at Water, Front, and South Street are where fill has been added. These elevations have remained constant or increased as the streets were built up. Sections of the remainder of the APE north of Pearl Street however, have been subjected to grading. Table 1 documents the known elevation changes after 1865, measured Above Sea Level (ASL), at street intersections in the Corridor Streetbeds APE. It should be noted that most of the roads in the APE were regulated and opened prior to 1865, and that the initial grading predates the cartographic recordation of elevations.

TABLE 1: STREET INTERSECTION ELEVATIONS IN THE CORRIDOR STREETBEDS APE, NORTH OF PEARL STREET

INTERSECTION	1865 & 1874 VIELE	1885 ROBINSON	1891 BROMLEY	2006 [1]SANBORN	CHANGE IN FEET (+/-)
Maiden x Pearl	Stream	6'	6'	6'	+6'
Maiden x William	Stream	11.9'	11.1'	*12'	+12'
Maiden x Nassau	Stream	21'	21.2'	24.2'	+24.2'
Platt x Pearl	-	5.5'	5.5'	-	No change
Platt x William	-	18'	18.2'	16.8'	-1.2'

[1] Where the modern Sanborn did not record elevations, the 1951 Sanborn elevations are included, as indicated by an asterisk.

INTERSECTION	1865 & 1874 VIELE	1885 ROBINSON	1891 BROMLEY	2006 [1]SANBORN	CHANGE IN FEET (+/-)
John x Pearl	-	4.6'	4.8'	4.8'	No change
John x Cliff	-	14.5'	-	*14'	-.5'
John x Gold	-	19.9'	-	*19'	-.9'
John x William	-	24.9'	24.11'	24.1'	-.8'
John x Nassau	29'	29.4'	29.5'	29.5'	+.5'
Fulton x Pearl	-	8'	8'	8'	No change
Fulton x Cliff	-	10.8'	15.1'	13.1'	+3.1'
Fulton x Gold	28'	23.8'	23.1'	23.1'	-4.9'
Fulton x William	-	27.9'	27.11'	27.11'	-.79'
Fulton x Nassau	35'	35'	35.11'	35.11'	+.11'
Fulton x Broadway	33.8'	31'	31.2	*32'	-2.6' or 1.8'
Fulton x Church	24'	24'	24.4'	*23'	+.4' or -1'
Ann x Gold	-	-	21.2'	*20'	-1.2'
Ann x William	-	30'	29.1'	29.11'	-.89'
Ann x Nassau	-	36.9'	37.3'	*35'	-1.9'
Beekman x Gold	12'	17.5'	17.7'	17.7'	+5.7'
Beekman x William	-	27.6'	27.8'	27.8'	+.2'
Beekman x Nassau	39'	36.2'	36.3'	36.3'	-2.7'
Spruce x Nassau	39'	37'	37.6'	37.6'	-1.4'

Table 1 demonstrates that out of the 24 intersections in the APE, only nine experienced an increase in elevation, and of those nine intersections, most of the changes were less than one foot. One of the exceptions to this is observed at the intersection of Beekman and Gold Street, which was apparently raised by over five feet; probably a result of filling nearby Beekman's Swamp (less than 100 feet away) and leveling a knoll immediately to the north (Viele 1865; Figure 4). The only other significant increases occurred along Maiden Lane where a stream was filled and elevations rose to between 6' and 21' ASL between Pearl and Nassau Streets.

Of the 24 intersections, only three experienced no change in elevation. The remaining twelve all experienced some degree of elevation reduction, with the greatest change observed at the intersection of Gold and Fulton Street; a location that was graded historically to control water runoff from higher elevations (MCC May 25, 1792; Vol. I:720). All of the other elevation reductions were greater than six inches, with the majority ranging between one and two feet (see Table 1).

The documented recent and historic grading, development, and construction episodes detailed in this section of the report have collectively disturbed the following locations in the Corridor Streetbeds APE:

TABLE 2: EXTENT AND LOCATION OF PRIOR DISTURBANCE TO THE CORRIDOR STREETBEDS APE

CORRIDOR STREETBEDS APE	TYPE OF DISTURBANCE	DEPTH OF DISTURBANCE (below ground surface)
Fulton Street between Water and William Street	Utilities	0-3'
Fulton Street between William Street and Broadway	Subway Stations Utilities	0-60' 0-3'+
Fulton Street between Broadway and Church Street	Utilities	0-3'
John Street between South Street and Water Street	Street Milling Utilities	18-24" 0-3'+
John Street between Water and Pearl Streets	Street Construction Utilities	0-2' 0-3'+
John Street between Pearl Street and William Street	Street Reconstruction	5-6'
Pearl Street between Maiden Lane and John Street	Street Milling Utilities	18-24" 0-3'+
Cliff Street between John Street and Fulton Street	Street Milling Utilities	18-24" 0-3'
Gold Street between John Street and Beekman Street	Street Milling Utilities	18-24" 0-3'+
Gold Street at Fulton Street	Grading	0-4'10"
William Street between Maiden Lane and Beekman Street	Utilities Street Reconstruction; Cut-and-Cover Subway Tunneling	0-3' 5-6' 0-30'
Nassau Street between Maiden Lane and Spruce Street	Street Construction Cut-and-Cover Subway Tunneling	0-3' 0-30'

In addition to the disturbances experienced by roadbeds, the locations of sidewalks have also been disturbed in numerous locations by the historical construction of buildings, sidewalk vaults, street cisterns, and similar features.

CORRIDOR STREETBEDS ARCHAEOLOGICAL POTENTIAL

For ease of discussion, South Street is considered to be the southernmost limit of the APE, Maiden Lane the western boundary, Church Street the northernmost boundary, and Spruce Street the easternmost boundary (Figures 1 through 4).

Precontact Land Use

When assessing site potential for Native American resources, archaeologists rely on several indicators: past environmental features of the site landscape, ethnographic accounts, published archaeological reports, and predictive models based on precontact settlement pattern data. Ethnographic accounts and archaeological material document the presence of Native Americans in Lower Manhattan.

Prior to the filling episodes along the Lower Manhattan shoreline that created the landscape evident today, the majority of the Corridor Streetbeds APE was upland and/or adjacent to the East River, (Viele 1865, Cartwitham 1740 [depicting 1730]; Lyne 1730; Grim 1813; Figures 4 through 7). Native Americans were actively utilizing resources in the area upland of the river. According to researcher S. Grumet, the very southern tip of Manhattan was called Kapsee by Native Americans in the 17th century (Grumet 1981:68). This location was described as a ledge of rocks at the southernmost point of Manhattan Island, probably in the vicinity of what is now Battery Park (Ibid.:17). To the north was a landform termed Ashibic, which was probably a narrow ridge or ancient cliff bounded by marshland to the south; this landform was located east of Beekman Street, and, therefore, the APE (Ibid.:3). In addition, "Catiemuts" was the Native American term reportedly used to describe a "fort or hill located near Pearl Street and Park Row," about eight blocks northeast of the project area (Ibid.:8). As reported in Bolton, Skinner and Parker's works, the southern tip of Manhattan, at the confluence of two major water systems, was probably exploited by pre-Colonial inhabitants for shellfish harvesting and perhaps even habitation (Bolton 1972; Skinner 1919; Parker 1920). Far southwest of the APE near Pearl and State Streets, where the c.1600 shoreline ran, early chroniclers reported abundant shellfish remains and speculated that the area functioned as a canoe landing (Geismar 1986:7).

Researchers have noted that during the precontact era there were periods of time when a distinct rise and fall of water levels occurred. In some locations these fluctuations allowed native peoples access to formerly inundated areas - such as the East River shoreline - for resource procurement and temporary camps. These "drowned shorelines" (e.g., as documented along the Hudson River shoreline in Weiss 1988:3) are a topic of research interest to archaeologists who postulate that precontact peoples would have been exploiting these areas and, therefore, their potential archaeological sensitivity should be addressed.

As noted above, prior to filling, portions of the Corridor Streetbeds APE were situated either elevated above or in the East River. While marshes or estuarial areas to the east of the APE were not necessarily suited for habitation immediately preceding European contact, their locations probably influenced the selection of precontact settlements, and may have served for resource procurement and as deposition areas where middens were created. Furthermore, when the East River was much lower and narrower during the precontact period, it is possible that later-

inundated portions of the APE could have been well drained and suitable for habitation. Alternatively, there may have been a salt water marsh along the edge of the river. Regardless, the East River shoreline was eventually filled to allow for historical development as far south as South Street. The surviving remnants of the surface that may have been previously exposed may now lie beneath deep layers of fill.

Precontact Archaeological Potential

The preservation of precontact sites in an urban environment is rare, largely because precontact deposits tend to be shallowly buried in non-alluvial or colluvial environments, and are vulnerable to disturbance from historical land use and development. This is particularly true in Lower Manhattan, where intensive development has occurred for more than three hundred years. Despite this, some precontact material has been recovered in recent years from archaeological excavations in Lower Manhattan. For example, in 1980 during the excavation of Stone Street, as part of the Stadt Huys block, aboriginal pottery and lithics were found in the lowest levels of the excavation (Baugher-Perlin et al. 1982:12). In the later Broad Street field investigation led by Joel Grossman, an *in situ* Contact Period feature was found in direct association with the Dutch West India storehouse (Karen Rubinson, personal communication to Cece Saunders, June 27, 1989). These artifacts are evidence of Native American occupation, but they do not represent habitation or midden sites with significant research potential.

Some of the environmental factors which contribute to potential precontact sensitivity include, but are not limited to, the predevelopment topography, distance to water, drainage conditions, soils, and resource availability. Early historic topographic maps and verbal descriptions of the early historic landscape serve to establish the likelihood that any particular area would have been well suited for precontact habitation or use. Later maps and atlases document subsequent changes in topographic elevation and potentially destructive development episodes. An analysis of available soil borings can also aid in establishing precontact potential by assessing the depths of prior disturbance.

The Corridor Streetbeds APE may have once been potentially sensitive for precontact resources due to predevelopment topography and proximity to water and upland resources, but historical and modern development has likely disturbed or, more likely, eradicated any potential resources. There is documented disturbance to the uppermost three feet immediately below grade in the streetbeds, and to a greater depth in specific locations (see Table 2). These historical disturbances would have compromised any shallowly-buried precontact resources.

Previous research conducted for the Second Avenue Subway project (Historical Perspectives, Inc., 2003a) concluded that Fulton Street south of Pearl Street was land under water at the time of European contact, but prior to this it may have been exposed and habitable during the precontact period. This location is now buried beneath layers of historical fill, introduced in the 18th century to allow for the creation of Fulton Street where Beekman's Slip once lay (Ibid.). Similarly, John Street was once the location of Burling Slip, and was filled historically to allow for the expansion of the waterfront. Any potential precontact resources at the site of both slips would have been disturbed, however; first by displacement due to natural current and tidal action for perhaps thousands of years, and later by the dredging of the slips in order to maintain a

deepwater channel. Both slips were dredged periodically to allow for the passage of ships as far north as Pearl Street, and tons of material from the river bottom were removed (MCC 1766 7:43,119; MCC 1767 7:78; MCC 1769 7:171; and MCC 1772 7:368). Therefore, both Fulton Street and John Street, south of Pearl Street, are not considered potentially sensitive for precontact resources.

Portions of the Corridor Streetbeds APE were previously assessed for potential archaeological sensitivity as part of the Fulton Transit Center archaeological assessment (Geismar 2003; Berger 2004; see Figure 5). This includes Fulton Street from slightly south of William Street north to Broadway, Fulton Street at Church Street, William Street between John and Ann Streets, and a small segment of John Street immediately south of Anne Street. The study of this portion of the Corridor Streetbeds APE concluded that there was no precontact potential due to extensive historical manipulation (Geismar 2003:6; Louis Berger 2004:6). Indeed, the FSTC study suggested that the study of roads and sidewalks in the immediate vicinity distinctly precluded the need to assess the potential for precontact resources, largely because of historical development and disturbances.

The potential precontact archaeological sensitivity of the remainder of the Corridor Streetbeds APE outside of the FSTC APE is generally considered to be minimal, at best. There are only two locations that appear to have been filled that could be potentially sensitive for deeply buried precontact resources, one being the intersection of Gold and Beekman Streets. This location was slightly uphill of Beekman's Swamp, a low-lying swamp ground that was filled and subsequently developed (Viele 1865; Figure 7). The elevation data collected for Table 1 shows that roughly 5.7' of fill was added here to raise the streetbed. If precontact resources existed in this area, it is possible that they have remained undisturbed and lie buried beneath roughly 6' of fill (Figure 17).

The other location that has been filled is immediately adjacent to the precontact East River shoreline, inland of the high water mark. Research for the Second Avenue Subway project identified the intersection of Pearl and Fulton Streets as potentially sensitive for precontact resources beneath historical fill (Historical Perspectives, Inc.:6.1-5). Although maps and atlases do not record a change in elevation at the intersection of Fulton and Pearl Streets since 1865, a soil boring conducted for the Second Avenue Subway project and taken at the intersection of Pearl Street at Fulton Street found that there was 7' of fill over sand (Boring MI-18; Historical Perspectives, Inc. 2003b:14). The report concluded that precontact resources in this discrete location may be as shallow as 7' below grade *if* they exist beneath the fill (Figure 17).

Subsurface conditions throughout the remainder of the APE, where deep fill levels have not been added, differ depending on the degree of prior disturbances from street grading, paving, utility installation, and subway construction, as presented in Table 2 of this report. It is generally understood, however, that at least the upper 3' of each paved street surface is disturbed. Furthermore, historical development that extended into the areas now beneath sidewalks has further compromised precontact potential (see discussion below). Therefore, the APE is considered to lack precontact potential for at least the upper three feet of each street and adjacent sidewalk, and this lack of sensitivity extends deeper in most of the APE (Figure 17).

The documented disturbances to the APE indicates that it probably has minimal sensitivity for precontact resources with research potential that would meet the criteria necessary for inclusion on the National Register of Historic Places. River inundation, tidal action, road grading and construction, utility installation, and episodes of development have most likely eradicated any fragile precontact resources that may or may not have been deposited in the APE, unless they lie deeply buried below historical fill, which would likely be found only near the precontact shoreline along Pearl Street and near the intersection of Gold and Beekman Streets (Figure 17).

Historical Land Use

The earliest settlement of Manhattan Island began with the founding of Nieuw Amsterdam by the Dutch in 1625. In the 17th century, a wall on the site of present Wall Street bounded the main part of the city on the northeast side, with the developed land beyond the wall partitioned by the Dutch into "bouweries" or farms. As described above, the East River shoreline at the time of European contact and into the early 18th century was located in and adjacent to the Corridor Streetbeds APE. Throughout the historical period, the need for new commercial waterfront real estate spurred the City of New York and entrepreneurs to be enthusiastic supporters of improvements to the East River shoreline. Filling episodes were undertaken to support and maintain the thriving waterfront economy as the coastline became overburdened with haphazardly built piers and slips, frequently congested by the natural accretion of river silt.

The 1687 Dongan Charter transferred ownership of all unencumbered lands within the low-water mark to the City of New York, inducing adjacent property owners to fill and develop their property along the waterfront (Buttenwieser 1987:27). Further inciting the expansion of Lower Manhattan was the 1731 Montgomery Charter that expanded land-ownership privileges four hundred feet beyond the low water mark or Water Street on the Lower East Side (Ibid:34). Eventually the shoreline at what is now Fulton Street and John Street was established southward at its current configuration.

In the 17th century, the upland area of the project site was divided into a number of larger tracts, encompassing several bouweries as well as common pasturage (Map RD 352, 1917; Stokes Vol. VI 1928:77, 236; Innes 1902; see Figure 8), each discussed below. In addition, the portion of the APE that was formerly in the East River, south of what is now Pearl Street, was surveyed and partitioned into water lots. The earliest development in the vicinity of the APE was generally centered on Pearl Street, which was laid out along the East River shoreline. Where Maiden Lane and Pearl Street intersect, a house was reportedly built on roughly an acre of land by Captain Lourens Cornelissen Vanderwol sometime around 1641 or 1642 (Innes 1902:299). He reportedly sold the house and land to Frederik Lubbertson in 1643, who then sold it to Jan Peeck in 1657 (Ibid.; Stokes Vol. IV 1922:98).

The portion of the APE roughly north of what is now Pearl Street, east of Fulton Street, and south of Gold Street, was granted by Governor Willem Kieft to Philip De Truy in a ground-brief dated May 22, 1640 (Stokes Vol. VI 1928:77). After De Truy was murdered in 1653, his wife conveyed the tract north of Pearl Street to Isaac de Forrest (Ibid.). The land was reconveyed by Governor Richard Nicolls to Thomas Hall in 1667, whose widow, Ann, sold most of it to her son-in-law William Beekman in 1670 (Ibid.). Included in the transfer to Beekman was a brew

house, horse mill, and other buildings at the easternmost end of the Smit's Vly (Smith's Valley), roughly in the vicinity of what is now the intersection of Maiden Lane and Wall Street (*Plan of New Amsterdam About 1644*, compiled by Innes 1902; see Figure 8). Sometime between 1710 and 1726 the heirs of William Beekman had the property professionally surveyed, laid out streets and blocks with lots "for buildings for the enlargement of the said City" (Ibid.:85), and by 1826 individual lots to the east of Fulton Street were being sold (Liber 31:133).

The portion of the APE roughly east and west of Fulton Street, excluding De Truy's parcel, and south of Broadway (then Kings Lane or Highway), was originally part of the Anthony Jansen van Vees bouwerie that stretched from the New Amsterdam boundary palisade (now Wall Street), to a distance about 1,250' northeast, although Vees probably only occupied the land along the shore of the East River near what is now Pearl Street (then known as Smit's Vly or Valley; Stokes Vol. VI 1928:155; see Figure 8).

In 1644 Cornelis Van Tienhoven was granted 24 acres in this tract, bounded by what are now Broadway, Maiden Lane, the East River, and a line 117'east of present Fulton Street, which he dubbed "Wallenstein" (Stokes Vol. VI 1928:155). Van Tienhoven served as bookkeeper and then provincial secretary to Governor Willem Kieft. Van Tienhoven's farm house, which he leased to a series of tenants, was reportedly built prior to 1655 and stood near the corner of present John and Pearl Streets, either in or immediately adjacent to the APE (Figure 8; Innes 1902:310; Stokes Vol. VI 1928:155, 316). A farm lane skirted the edge of a hill overlooking the East River, linking the Van Tienhoven farm house with an orchard that occupied the project site and the surrounding acreage at the summit (Innes 1902; Figure 8). The house was described as:

> A low-roofed Dutch farmhouse, with its stoep, its swinging half-doors, its small-paned and heavy-shuttered windows, and its capacious exterior chimneys; a little way to the right (or east) of the building the spectator saw its outer cellar, partially excavated in the hill, and partly sodded over. Within the lane, at the foot of the hill, was a spring or well house, to which a well-worn path led down from the farm house. (Innes 1902:310)

After Van Tienhoven died, his wife sold the farm to Jan Smedes in 1671. In 1675 Smedes sold the western portion of his tract, from about 100' west of Gold Street to Broadway, to four men; Coenran Ten Eyck, Carsten Luersen, John Harpendick, and Jacob Abrahamsen. Together these four shoemakers and tanners established their tanning-pits on the low ground along Maiden Lane, in the vicinity of Gold Street – outside the APE (Innes 1902:296, 316; Stokes Vol. VI 1928:155). A portion of this acreage along Broadway was used for pastureland, and became appropriately known as "Shoemakers Field" (Ibid.). A survey of the Shoemaker's tract, drafted in 1696 and reproduced in Stokes (Vol. I 1918:236), indicates that the tract was bounded easterly "by a fence which separated it from Van der Cliff's Orchard," approximately the center line of the block between William and Gold Streets, directly west of the APE (Ibid.:236-237).

The four landowners of the Shoemakers Farm, as it became known, owned the land from what is now roughly Anne Street to Maiden Lane, from about 100' east of Gold Street, north to Broadway (Shoemakers Farm Survey, 1807; Map RD 352, 1917). Small garden plots were reportedly established along what is now Broadway (then the Kings Highway), and the

remainder of the tract was used for pasturage. In 1696 the property was subdivided, streets were laid out, and lots were devised and sold individually (Stokes Vol. I 1918:237; Innes 1902:316). In addition, the wealthy John Harpendick willed a portion of his land in this tract to the Dutch Reformed Church. The North Dutch Reformed Church was subsequently constructed in 1767 at the intersection of what are now Fulton and William Streets (Moss Vol. I, 1897:343).

In 1677 Smedes sold the western portion of his tract, including the bouwerie house and about five or six acres of land, to Hendrick Rycken (a.k.a. Ryker), a blacksmith. Ryker then sold this tract to Dirck Jansen Vanderclyff[2] in 1681 (Innes 1902:317). Dirck and his wife Geesje lived in the farmhouse for many years. Dirck apparently established a tavern or "resort" at the house, which he called "the Orchard," as referenced in 1682 by the Court of Mayor and Alderman (Stokes Vol. IV 1922:321). The Abstracts of Wills (Vol. II. 1708-1728:) reports that Dirck Van Cliff (sic) testified that:

> Captain Baxter, Mr. Graham, Mr. Sharpe, West, and others, were at his house in the Orchard last night, Drinking a glasse of Cyder and Wine, and some healths were drunk and Mr. Graham and Mr. Baxter discoursed together friendly, and went aside from the Company, as he thought, to discourse in private, and in a short time Mr. Graham told him he was wounded, and bid him send for the Doctor and Neighbours, but did not see Captain Baxter draw his sword. (Ibid.).

Secondary historical accounts also cite the area as "Vanderclyff's Orchard," suggesting that both the farm land and the tavern shared this name (Moss Vol. I, 1897:343; Stone 1872:89). Vanderclyff's land was later called "Golden Hill" during the American Revolution; a reference to the golden wheat that grew on it in the summer months, or to the yellow flowers of the celandine plant that grew there (Stone 1872:90; Mercantile Library Association 1861:22). Golden Hill became a popular recreational destination by the 1770s, with a number of taverns or "houses of suburban entertainment" (Stokes Vol. IV 1922:627).

After Dirck Vanderclyff died in 1695, his wife Geesje began to sell off segments of the farm in smaller lots. The original farm lane ran along the edge of the hill, parallel to the East River. It was officially laid out in 1696 and Geesje named it Orange Street. This later became Vanderclyff's Street, and then Cliff Street - directly south of Fulton Street (Childe 1901:54; Street Books, Manhattan Borough President's Office; Innes 1902; Figure 8). Where the lane turned to the northwest at a right angle, it formed a second street for Vanderclyff's subdivision (Innes 1902:317; Figure 8). This second small road she designated as Nassau Street, but this was merged with Fair Street – laid out by the Shoemakers west of Gold Street when they were subdividing their property, and it was eventually renamed Fulton Street in 1818 (Child 1901: 54; Street Books, Manhattan Borough President's Office). Geesje Vanderclyff lived in the farmhouse through at least 1711, and it is believed that she continued to run it as a tavern (Innes 1902:318). By that time most of her original landholdings, apart from the farmhouse, had been lotted and sold.

[2] Note that Vanderclyff was recorded as Dirck, Deter, and Dedrick, with Vanderclyff being spelled numerous ways including, but not limited to, Van Der Clyff, Vandercliffe, Vanderclyffe, VanClyff, Van Cliff, and Van Cleef.

The section of the APE that extends east from Fulton Street, north of what is now Nassau Street, was once part of the Common Pasture designated by the Dutch. This open area was used communally for pasturage, and was confirmed by the Dongan Charger of 1686 (Harris et al 1993:3). To the northeast of the Corridor Streetbeds APE, a portion of the Common Pasture eventually became City Hall Park.

The portion of the APE to the northwest of Broadway was part of the Bouwerie of the Dutch West India Company, and known by various other names through the early 18th century. Under British rule, Trinity Church received an enormous land grant from Queen Anne in 1705; it ran for over a mile and a half along the Hudson River, from Christopher Street to Fulton Street, with Broadway serving as its boundary. At that time the Company land became part of Trinity's landholdings, and St. Paul's Chapel was eventually built at the northeast intersection of Broadway and Fulton Street (Stokes Vol. VI 1928:79-80).

The earliest maps of what is now Lower Manhattan focused primarily on development southwest of Wall Street, which served as the northeastern boundary of the original settlement (e.g., Adams 1916 [Redraft of *The Castello Plan* 1660]; Nichols 1664-1668). The City's growth was encouraged, in part, by the adoption of the 1687 Dongan Charter that transferred ownership of all unencumbered lands within the low-water mark, including the Corridor Streetbeds APE, to the City of New York, and encouraged adjacent property owners to fill and develop their land along the waterfront (Buttenwieser 1987:27).

The 1696 Miller Plan, drawn from memory, extended as far north as Fulton Street along the shoreline and shows the approximate location of the APE (Miller 1696). At that time it appeared that a row of structures or a wharf had been built along portions of what is now Water Street, near the APE, but not directly in or adjacent to it. This development was bolstered by the 1692 selling of lots along the East River between Wall and Fulton Streets with the proviso that wharves be built adjacent to riverfront lots (Augustyn and Cohen 1997:52; MCC May 6, 1692, Vol. I:273). Wharf construction and filling also allowed for the creation of a slip at John Street sometime before 1692. In 1703, water lots along the shoreline east of what is now Fulton Street were also surveyed for sale (MCC April 17, 1719; Vol. III:200). As the shoreline pushed southward, Burling Slip – known for a period as Lyons Slip, Rodmans Slip, and Van Clyffe Slip – was created at John Street, and Beekman Slip was created at Fulton Street. Eventually the shoreline at what is now Fulton Street and John Street was pushed toward to its current configuration.

As the population in the city grew, so too did the extent of development and concurrent surveying and recordation efforts (e.g., Carwitham 1740; Lyne 1730; Grim 1813; Maerschalck 1755; and Ratzer 1766/67; Figures 9 through 12). Maps and atlases show that as the shoreline of the East River pushed southward, development upland increased. The project site area was first developed as a mixed residential and commercial center in proximity to the shoreline, with more residential use further inland.

The 1865 Viele map of watercourses shows the upland portion of the APE, north of Pearl Street, as it would have looked before development (Viele 1865; Figure 7). Prior to the grading and filling episodes that created the landscape that we see today, Fulton Street between Water Street

and Church Street climbed a hill north to Cliff Street, and skirted the base of a hill between Gold and Church Streets; its elevation peaking in the vicinity of Broadway before it declined toward Church Street (Ibid.). Historically, the topography along John Street rose steeply between Pearl and Cliff Streets, where the road then skirted along the western edge of another terrace to William Street. Cliff Street, originally a farm lane, once ran along the edge of the hill, parallel to the East River (Childe 1901:54; Street Books, Manhattan Borough President's Office; Innes 1902; Viele 1865; Figures 7 and 8). Gold Street ran from the top of a terrace at John Street east to the base of a hill at Beekman Street. William Street ran up a hill between Maiden Lane and John Street, and then ascended a second hill between Fulton and Ann Streets. From Ann Street eastward, it was situated at the very southern edge of a terrace. Finally, Nassau Street followed a parallel course to William Street, and also climbed two hills between Maiden Lane and Ann Street. East of Ann Street, Nassau Street was relatively level as far east as Spruce Street (Ibid.: Figure 7).

The following Street Histories section documents the development of each streetbed and its associated sidewalk in the APE (see Figures 1 through 4 for locations).

- **Street Histories**

For ease of discussion, South Street is considered the southern boundary of the APE, Maiden Lane is to the west, Church Street is to the north, and Spruce Street is to the east.

Fulton Street between Water Street and Church Street

Fulton Street was historically known as Fair and Partition Street, and will hereafter be referred to as Fulton Street, unless historical references mention otherwise. Between Pearl and Water Street, it was originally land under water between the high and low water marks along the shoreline of the East River, and between Pearl and Church Street the route crossed uplands (Viele 1865, Figure 7). In 1719 the Common Council ordered that the City Alderman survey and lay out the ground belonging to the City from the high to the low water mark fronting the ground of Johannes Beekman, John Cannon, Gilbert Livingston and others at the lower end of Queen Street (now Pearl Street) and to establish the dimensions of every lot (MCC June 12, 1719, Vol. 3:204). The area immediately abutting Fulton Street between Water and Pearl Streets became part of the Water Lot Granted to Gerardus Beekman that same year (Map RD 352, 1917; Water Lot Grants Vol. B:86-88). The grant described the water lot boundaries as follows:

> ... easterly by the land lately granted to Johannes Beekman and southerly by the East River or harbor of the said City at low water mark and *westerly by a Public Wharf or street a slip of twenty four foot wide to be made and built by the said Gerardus Beekman*....and build erect and make a good and sufficient and firm wharf or street of thirty foot English measure in breadth the outward part whereof toward the River or harbor... (Water Lot Grants Vol. B:86-88)

Gerardus Beekman was responsible for building a 24' wide wharf on the western edge of his lot to allow for the creation of what became known as Beekman's Slip where Fulton Street now lies (Map RD 352, 1917; Water Lot Grants Vol. B:86-88). This slip allowed for the continued

passage of ships from the harbor as far north as Pearl Street. In 1784 at least part of the slip was still open, when William Malcom and others, inhabitants at the slip, were ordered by the Common Council to fill a portion of it. Concurrently, an order was issued for "removing an old Hulk out of the said Slip" (MCC June 23, 1784 Vol. I:52). The hulk was reportedly brought there by a late war privateer, and was owned by Frederick Rhinelander. Prosecution of the "proprietors of the said Privateer" was threatened if the hulk were not removed (Ibid.). The slip was ultimately filled and opened as a street sometime between 1767 and 1789, mostly likely following the 1784 request of the Common Council (Ibid.; Ratzer 1766/67; McComb 1789, Figures 12 and 13).

The segment of Fulton Street upland of the East River, north of Pearl Street, was originally laid out as Fair Street from Broadway to Cliff Street in 1690, but was not shown on maps until 1730 (Lyne 1730; Figure 10). The section of the road between Cliff and Pearl Streets was not laid out across Block 75 until ca. 1818 (Street Books MBPO; Bridges 1807-1811; Burr 1832). Block 75 was developed, in part, prior to 1730 (Lyne 1730; Grim 1813; Figures 10 and 11). North of Broadway, Fulton Street was laid out as Partition Street prior to 1750, and was released to the City by Trinity Church in 1761 (Stokes Vol. VI 1928:594, 597).

A small frame meetinghouse of the Moravian Church was erected in 1751 at the corner of Fulton and Dutch Streets. On the southeastern corner of Fulton and William Street, the North Dutch Church was constructed in 1767 – on the land bequeathed by John Harpendick (Mercantile Association Library 1861:24). The Church was used as a prison by English soldiers during the American Revolution, and it is reported that "at one time eight hundred Americans were crowded into it, and they suffered greatly from hunger, cold, and sickness" (Moss 1897:344). When the building was demolished, the associated graveyard was abandoned; bodies were disinterred and removed to Green-Wood Cemetery (Ibid.:345).

Prior to 1790, there had been a controversy over the proposed width of Fulton Street north of Broadway. The original plan called for a width of 40', but after the fire of 1776, all the houses that had been built according to that plan had burned down. A new width of 65' was proposed, but a compromise set it at 58' (Stokes Vol. V 1926:1202). An ordinance was passed to regulate this section of Fulton Street (then Partition Street) in 1787, and in 1788 it was regulated as follows:

> From the West [north] side of Broad Way to the pump opposite the End of Church Street the Descent to be 2 ¼ inches on 10 feet & from thence to the middle of Greenwich 3 ¾ Inches on 10 feet. (MCC July 12, 1787 Vol. I:303, 389)

Historically, the remainder of Fulton Street underwent additional intrusive modifications. According to the Minutes of the Common Council, in 1790 there was:

> ...difficulty draining water off the head of Fair Street. Fair Street [now Fulton] is nearly dead level with William Street [one block west of the APE] which being already paved a material, Injury would arise to dig it down so as to lead the water eastward from Broadway. (MCC May 14, 1790; Vol. I:546)

It was determined that a common sewer should be dug along Fulton Street's edge to improve drainage, rather than to grade the road downward east from Broadway to William Street. Four months later Matthew Redette was paid for paving this portion of Fulton Street (MCC September 17, 1790; Vol. VI:594). In 1792 Fulton Street was regulated from Gold to Cliff Streets. This entailed regrading the street to have an ascending pitch of 1½" per each 10' for the first 248' east from Gold Street, and then a descending pitch of 1½" per 10' east to Cliff Street (MCC May 25, 1792; Vol. I:720). In either 1815 or 1818 the street was legally adopted and extended southeast across developed City Block 75 to Pearl Street (*Map ACC No. 21997*). The name Fulton Street was assigned for its entirety at that time (Street Books MBPO). In 1835 it was reportedly widened to 55' between Broadway and Ryders Alley, by taking 20' from the blocks along the western side of the street (Street Books MBPO; *Map ACC No. 21997* 1912-1915 MBPO). Between Ryders Alley and Cliff Street the widening caused land to be taken on both the east and west sides of the street, when a sharp angle was straightened to allow for the road to be continued on a straight path to join the street at Beekman's Slip (*Map ACC No. 21997* 1912-1915 MBPO). It was widened again between Gold and Pearl Streets in 1958 (Street Books MBPO).

A well and pump were installed in Fulton Street near William Street in 1813, although it is not known if its location was in the Corridor Streetbeds APE (MCC 1813 VII:539). Another well and pump were assessed by the Street Commissioner on Fulton Street, between Gold and Cliff Streets in 1816 (MCC December 2, 1816 Vol. 8:703). It is unknown whether or not this is the same pump reportedly installed in 1813, but it is quite possibly one and the same. A report by the Street Commissioner indicated that Robert Henderson had built several houses on Fulton Street at the corner of Cliff Street that encroached on the road by 13" (MCC November 5, 1816 Vol. 8:672). The houses were ordered removed the following month (MCC December 9, 1816 Vol. 8:714). Gas lights were installed along the route of Fulton Street in 1830 (Stokes Vol. VI 1928:594).

Currently, the section of Fulton Street between Pearl and Gold Streets is approximately 90' in width, including sidewalks, a result of road improvements in ca.1966. To widen Fulton Street, the developed city lots on the eastern side of the road between Pearl and Gold Streets were truncated, and buildings were razed. Former building lots on the east side of Fulton Street were incorporated into the sidewalks and street. It should be noted however, that all of the buildings fronting Fulton Street prior to this event were four- and five-story buildings with basements (Sanborn 1951). A recent archaeological assessment of Block 94, bounded by Fulton, Ann, Gold, and Cliff Streets, concluded that there was no archaeological potential from the surface down to 10' below grade due to the depths of prior basements (Historical Perspectives Inc., 2006:37). The depth of impacts on the block immediately to the south, between Fulton, Anne, Cliff and Pearl Streets, is likely similar due to basements beneath four- and five-story buildings.

John Street between South Street and William Street

The section of John Street south of Pearl Street has a very different history than the section of John Street to the north. Currently, John Street between Pearl and Water Streets is roughly 70' wide, and between Water and South Streets is roughly 50' wide. The route jogs to the west at Water Street; a result of the construction of One Seaport Plaza to the east that extends into the

former roadway. Historically, John Street was the location of Burling Slip, which extended from Pearl Street to the south.

Historical cartographic resources confirm that what is now John Street between Pearl Street and South Street was situated in the East River through at least the mid-18th century (e.g., Lyne 1730, Carwitham 1740; Grim 1813 [depicting 1742-44]; Figures 9 through 11). As the shoreline pushed southward, Burling Slip – known for a period as Lyons Slip, Rodmans Slip, and Van Clyffe Slip – was created between City Blocks, where John Street now exists. The slip allowed cargo ships to dock along wharves protected from the currents of the East River. Wharf construction and filling allowed for the creation of the slip due south of Pearl Street sometime before 1692. At that time two wharves, each twelve feet wide, were constructed on either side of the "slipp of Mrs. Van Clyffe" (MCC 1692 I:279). The slip, then 24 feet wide, was to be maintained by the city (Ibid.). By 1730, filling had extended south far enough to allow for the creation of Water Street northeast and southwest of the slip, although the slip – and hence the future location of John Street – remained open and inundated south of Pearl Street (Lyne 1730, Figure 10).

In 1736 a 200-foot water lot was granted to James Alexander and Archibald Kennedy for the area lying between Burling Slip and Fletcher Street (one block west of the APE), in order "to make further improvements for the better conveniency of trade and navigation and enlargement of this City in its buildings" (MCC 1736 4:323). In 1737 a water lot was granted to Henry Van Borsom on the east side of the slip, adjacent to the APE (MCC 1803 3:232). Borsom's lot was subdivided into the three lots; the easternmost going to John Riker (MCC 1803 3:232). In 1749, a similar grant was given to David Provoost for a 200-foot water lot to the east of the slip. Provoost was responsible for building a wharf "of the breadth of 18-foot [and] building a strong and substantial peer [sic] and leaving a street of 18-foot in breadth &c. and that he constantly keep the same in good and sufficient repair" (MCC 1749 5:288).

These early 18th century water grants provided for the creation of land north of Front Street (formerly Dock Street), but the process of wharf construction and filling was slow to become realized. By 1766 a wharf had been constructed on the west side of Burling Slip, extending what is now John Street southward as far as Front Street - then identified as Burnett's Key (Montresor 1766; Ratzer 1766/67, Figure 6; Stokes Vol. III 1918:988). On the east side of the slip, however, construction and filling extended only mid-way between what are now Water and Front Streets. An undated plan of waterfront lots shows that 18' piers were eventually constructed on either side of Burling Slip between Water and Front Streets, in the route of what is now John Street, and that the width of the piers and the open slip in this location was 83.6' (MBPO *ACC No 30041: 1772*).

As the shoreline edged south, the northern end of the slip was filled to allow vehicular and pedestrian passage over Water Street. Van Borsom, who had purchased a water lot here, sold it to Rem Remsen in 1742, and Burling Slip was ordered filled up in 1760 (MCC October 30, 1760 Vol.VI:226). In 1761 John Sackett was paid £77 for filling a portion of Burling Slip, and in 1767 the slip is shown filled as far south as the north side of Water Street (Ratzer 1766/67, Figure 12; MCC 1761 VI:259). Filling continued to push the shoreline south through the end of

the 18th century. As the slip was extended south to the new shoreline, the City of New York retained ownership of the water rights (Stokes Vol. IV 1922:858).

The first granting of lots south of Front Street between John Street and Fletcher Street dates to 1773 (Soil Systems Inc. 1981:7). At this time Jacob Brewerton was granted a water lot in front of his store house in the East Ward to extend:

> from the south side of the wharf or street, two hundred feet into the River under the river...and make at his own expence [sic] for the use of this Corporation, a street or pier of 18 feet on the northeast side of the water lot to be granted him the whole length thereof to be continuous to a certain slip called & known by the name of Burling Slip & that the streets & pier there be built be finished on or before the 25th of March 1777... (MCC 1773 7:433)

This grant allowed for the creation of a portion of Block 72 west of John Street between Front and South Streets. Shortly thereafter, in 1786, a petition was filed with the Common Council calling for filling the east side of John Street (then Burling Slip) between Front and South Streets:

> A petition for several Inhabitants at Burlings Slip praying that the East side of the said slip may be wharfed out equal to the West side & that the street in front of the said Street may be paved... (MCC 1786 1:223)

Despite approval of the petition, two years later the wharfing and filling of the east side of the slip was either inadequate or incomplete. In an effort to improve the northeast side of the slip, in 1788 the Common Council moved to inform the proprietors of the lands adjoining the east side of the slip, namely John Riker, that unless it was properly wharfed out and improved to the conditions of the original grant by December 1, the board would take "measures" (MCC 1788 1:399). Concurrently, a petition of Peter Van Zandt was heard regarding "running out a pier on the west side of Burling Slip," as was a petition of John Byvanck and others "praying that the said Slip may be filled up & Front Street continued across it" (Ibid.).

A 1789 map shows that a wharf on the west side of the slip had been extended southward, but not quite as far as the future route of South Street (McComb 1789; Figure 13). The map also suggests that a wharf had been constructed on the east side of the slip as far south as what is now South Street, within or adjacent to the east side of the APE (Ibid.). Contradicting this configuration, the 1797 Taylor-Roberts map shows that neither the east nor west sides of the slip had been extended as far south as the future route of South Street (Taylor Roberts 1797; Figure 14). Both maps, however, show that the slip itself remained open for passage as far north as Water Street, suggesting that Byvanck's 1788 request to fill Front Street was tentatively stalled.

Throughout the end of the 18th century and into the mid-19th century, Burling Slip remained open to passage as far north as Water Street, despite several petitions and pleas that were made to fill portions of it (Stokes Vol. VI 1928:668-669; MCC 1788 1:233; 362, 399; 1805 4:78; McComb 1789, Figure 13; Taylor-Roberts 1797, Figure 14; Bridges 1807; Burr 1832). The brackish water in the slip was considered a nuisance and a possible contributor to a yellow fever epidemic of

lower Manhattan in the 1790s (McAtamney 1909:100; Stokes Vol. VI 1928:669). An undated plan of waterfront lots shows the width of the unusually wide slip between Front and South Streets as ranging between 139.1' and 142' (MBPO *ACC No 30041: 1772*).

In 1801 the City of New York passed an act regulating the buildings, streets, wharves, and slips and directing the proprietors of lots adjoining streets or wharves along the river to fill intermediate spaces. In return, the proprietor would obtain ownership of the filled area (MCC 1910 6:73). According to the Water Lot conveyances, in 1803 the water lot between Front and South Streets, east of John Street, had been granted to George Codwise (Manhattan Borough President's Office, nd; Water Lot Grants Book E:57). George Bowne (1804) and Peter Schermerhorn (1807) were granted the lots directly to the east of Codwise's shortly thereafter (Ibid.).

On the west side of the slip, Robert Carter held the water lot between Front Street and South Street, with Peter Van Zandt owning a small lot to the south, fronting South Street (Water Lot Grants Book E:57). The City of New York had granted Van Zandt a water lot on the southwest side of Burling Slip extending into the East River 200 feet from Front Street in 1803 (MCC 1810 6:73). His holdings included 43 feet of intermediate space that needed to be filled (Figure 7). Upon doing so, he believed he also had the rights to the water in the slip and along the East River shoreline at South Street (MCC 1810 6:73). The Common Council verified Van Zandt's legal title to the 43 feet of filled ground, but refuted his rights to the waterfront and to "obstructing the entrance into a public slip." They concluded that Van Zandt's claim "to the water in the slip, in front of his 43 feet of ground & at the end of South Street including the wharfage is not well founded" (Ibid.).

In 1803 a petition was filed by John Riker, Simeon and Rem Remson, Jordan Wright, Thomas Pearsall and others regarding Burling Slip. It was their opinion that in order to serve the mercantile interests of the City, Burling Slip should be extended eastward to make it 100 feet wide, and that the wharf on the east side should be 25 feet wide. They further requested that the owner of the water lot adjoining the wharf (presumably Codwise) be directed to take out his grant and that the wharf should be completed by December (MCC 1803 3:294).

Responding to the petition, in 1807 Peter Schermerhorn and George Codwise filed a petition for the construction of a pier or wharf at Burling Slip and requesting compensation by the City of New York (MCC 1807 4:471). The Common Council concluded that Schermerhorn and Codwise should be permitted to contract with someone to build a pier and that the City would pay one-third of the expense. In return, they would be entitled to receive the wharfage on the east side of the pier for two berths of ships, or for the use of the water within 60 feet of the pier (Ibid.). The pier was to extend from the south side of South Street out into the East River.

By 1809 the Common Council recognized that it was likely that Burling Slip would be filled in the near future (MCC 1809 5:638). Despite this, it was still a vital commercial element in the early 19th century, being sufficiently clear to allow passage of sea-going vessels. By 1811 land due east of Burling Slip and what is now John Street had been filled by the three owners of water lots (Codwise, Browne, and Schermerhorn), and several buildings had been constructed (Ibid). That same year, inhabitants near the slip complained to the Common Council that sea vessels

were in the habit of lying in the slip to the exclusion of the coasters – which was impeding trade in this part of the city (MCC 1811 6:698). The citation of Burling Slip being a "public slip" in 1810 indicates no private ownership (MCC 1810 6:73). The 1873 *Map of the High and Low Water Mark and the Original City Grants of Lands Under Water* also fails to show any private owner of the slip (Department of Docks 1873).

Several large conflagrations plagued lower Manhattan in the late 18th and early 19th centuries that may have contributed to the subsequent filling of the waterfront. In December of 1816 a resolution to take the property between Water and Front Streets, Burling Slip and Fulton Street for a new market was considered, given that all of the buildings on these lots had been destroyed by a fire in the recent months (MCC 1816 8:724).

The slip's commercial importance was further highlighted in 1828 when Henry Dudley and others petitioned to permit vessels of 150 tons entry to the slip, and to prevent dismantled vessels from lying in the slip during the winter months (MCC 1828 16:658). In 1832 the slip remained passable as far north as Front Street (Burr 1832).

In early 1835 the Common Council moved to have the slip filled south of a point midway between Water and Front Streets. At that time a State Commissioner presented "a draft of an ordinance for building a bulkhead across Burling Slip, continuing the drain to South Street, and filling up the said Slip"(MCC 1835 8:112-113). The bulkhead was constructed on the south side of South Street to allow for its creation. The work to accomplish this was not permitted to begin until March 1 of that year (Ibid.). Assessments were made for the work in October of 1835 (MCC 1835 8:135; 9:310), and in January 1836 returns of delinquents on assessments were made and warrants were issued to the collectors as not all assessments had been paid (MCC 1836 10:123, 134). Maps show that what is now John Street was entirely filled as far south as South Street between 1833 and 1836 (Hooker 1833; Colton 1836) indicating that the issue of delinquent assessments was either resolved or that it failed to hinder the ultimate goal of filling the slip.

If the slip was not entirely filled by the end of 1835, as the delinquent assessments may suggest, it is entirely possible that demolition debris from the Great Fire of 1835 – which took place in early December and devastated over 600 buildings in Lower Manhattan – was used as fill, although there are no records available to support this.

Following the filling of Burling Slip in 1835-36 by the City of New York, John Street remained vacant – serving vehicular access to the waterfront at South Street (Colton 1836; Tanner 1838; Ensign 1845; Dripps 1852, Figure 15; Perris 1852, 1857-62; Bromley 1879; Robinson 1885, 1893, Bromley 1897, 1911, 1916, 1926, 1932, 1974; Hyde 1913; Sanborn 1984-85, 2005, Figure 4). The only changes to the configuration of John Street occurred with the construction of One Seaport Plaza east of John Street which resulted in a reduction in the width of the road between Front and Water Streets.

To the north of Pearl Street, John Street was historically a farm road that led from Pearl Street uphill to the bouwery house of Cornelis Van Tienhoven, reportedly built prior to 1655 near the corner of present John and Cliff Streets (Figure 8; Innes 1902:310; Stokes Vol. VI 1928:155,

316). The house and several acres eventually fell into the hands of Dirck and Geesje Vanderclyff, who maintained a tavern on it. For some time this portion of John Street was called Vandercliff's Street, and then Golden Hill Street; a reference to the hill the road climbed, known for the color of the local flowers that grew in the summer (Stokes Vol. VI 1928:596). The Golden Hill area became a popular recreational destination by the 1770s, with a number of taverns or "houses of suburban entertainment" (Stokes Vol. IV 1922:627). The extreme southern end of John Street was officially laid out in 1692 to the low water mark (MCC May 6, 1692 Vol.I:274). The Vanderclyff farm was sold and subdivided in 1696, and several surrounding roads were established in the immediate vicinity shortly thereafter.

North of Cliff Street, John Street - named for John Harpendick of the Shoemakers Farm - was laid out in 1690, and ran across the entirety of Manhattan (Geismar 2003:10; Stokes Vol. III 1918:1003; Carwitham 1740; Lyne 1730; Figures 9 and 10). In 1774 a petition was made to "dig down and regulate" Golden Hill, although it is not clear if or when this was carried out (MCC April 12, 1774, Vol. 8:24). Alterations were made to John Street – then Golden Hill Street - in 1784 and 1785, and in 1793 an act was passed by the New York State Legislature to enact further improvements (MCC June 23, 1784 Vol. I:52; Stokes Vol. VI 1928:596).

By 1785 portions of John Street had been regulated and paved (MCC March 12, 1788; Vol. I:356). The road was expanded and merged with the portion of John Street that had been laid out to the north, but it was not widened until after 1789. When a survey of the lower end of the road at Pearl Street (then Queen Street) was undertaken in 1789, its narrowness led the proprietors of the two corner lots to offer a part of their land to improve the street (MCC November 20, 1789 Vol. I:505). In 1792 it was reported that John Street from Pearl Street north ranged in width between 12'4", 16'9", and 17'4". A recommendation was made to widen and straighten the street "taking about 8 feet 8 inches from the front of the House and Lot of Thomas Pearsall on Queen Street and 3 feet 2 inches at the end of his House on Golden Hill" (MCC January 21, 1793 Vol. I:764). The street was widened by 1797, and residents who lost land petitioned the Common Council for compensation (Stokes Vol. VI 1928:596). The street was reportedly widened to 45' between Pearl Street and Broadway in 1836 (Ibid.: Geismar 2003:13; Map *ACC No. 21997*). During the 1770s a series of wells were laid out on Golden Hill, although their exact locations were not recorded (MCC Vol. 7:43, 49, 121, 123-125).

Pearl Street between Maiden Lane and Fulton Street

Pearl Street, originally Queen Street, or Smit's Vly or Fly (Smith's Valley), ran along the East River shore of Manhattan as it existed when the first European settlers and explorers arrived on the island. The portion of Pearl Street in the APE was laid out as a street prior to 1660, but was not officially opened until 1707 (Adams 1916 [Redraft of *The Castello Plan* 1660]; Nicolls 1664-1668). Its original width is estimated to have been approximately 30' in the APE (NYCLPC 1982; WPA 1937; Stokes Vol. VI 1928:599). It was paved as far north as Mrs. Beekman's house, a few hundred feet east of the APE, in 1701, but it wasn't regulated until 1744 (Ibid.). In 1831 the road was widened west of John Street to 51.25', and in 1835 it was widened to 45' at Maiden Lane. Near Fulton Street it was widened to 38.6', also in 1835 (Map *ACC No. 21997* MBPO).

Pearl Street between Burling Slip (John Street) and the Fly Market (now Maiden Lane) was reported the site of the "Battle of Golden Hill," fought as part of the American Revolution in 1775 (Mercantile Library Association 1861:22). Stokes identifies a Revolutionary War period redoubt directly east of Fulton Street, south of the APE (Stokes Vol. III 1918:Plate 174).

Cliff Street between John Street and Fulton Street

The original farm lane of the Vandercliff Farm ran along the edge of the hill, parallel to the East River. It was in use as early as 1655, but was officially laid out in 1696. It was originally called Orange Street by Geesje Vandercliff. This later became Vanderclyff's Street, and then Cliff Street - directly west of Fulton Street (Childe 1901:54; Street Books, Manhattan Borough President's Office; Innes 1902; Figure 8). Where the lane turned to the north at a right angle, it formed a second street for Vandercliff's subdivision (Innes 1902:317; Figure 5). This second small road Vandercliff designated as Nassau Street, but this was merged with Fulton Street – laid out by the Shoemakers west of Gold Street when they were subdividing their property – and it was eventually renamed Fulton Street in 1818 (Child 1901: 54; Street Books, Manhattan Borough President's Office).

Part or all of Cliff Street was leveled in 1763 (MCC August 24, 1763 Vol. 6:337). In 1786, additional efforts were being made to open and regulate Cliff Street between John Street and Beekman Street. At that time a petition was made by Samuel Franklin and others, asking the Common Council to purchase "a House & Lot of the Estate of Henry Brasher decd. for the opening of the Street" (MCC April 19, 1786 Vol. 1:213). The petition must have been honored or an agreement reached, as Cliff Street was regulated between Beekman Street and John Street in 1792 (MCC May 25, 1792, Vol. 1:720). At that time the street was to have an ascent of 1 ½" on 10' between Beekman and Fulton Streets, where it was to be lowered by 2'4", then with a descent of just a bit more than 2" per each 10' to John Street (Ibid.). In 1817 the Street Commissioner reported that a house belonging to the late Abraham Bokee was standing in and encumbering Cliff Street, but the exact location of the house is not identified (MCC June 16, 1817; Vol. 9:204). Regardless, it was preventing the opening and regulating of the street at that time.

According to Map *ACC No. 21997*, on file at the MBPO, Cliff Street was widened on its northern side in 1835, and roughly 14' to 19' of land on the south side of Block 76 was incorporated into the roadbed and adjacent sidewalk. This allowed the width of the street to expand to between 45' and 48' (Ibid.).

Gold Street between John Street and Beekman Street

Historically, Gold Street was known as Brewers Hill from Maiden Lane to John Street, and from John to Fulton Street was called Vandercliff Street for a period of time (Ibid; Carwitham 1740; Figure 6). Between John Street and Maiden Lane, it was also called "Rutgers' Hill" in 1767 (Mercantile Association Library 1861:24). By 1730 the portion of Gold Street between what is now Maiden Lane and Fulton Street had been laid out as Vandercliff Street (Lyne 1730; Figure 7). In 1750 a well was laid out somewhere on "Van Cleaft Street" (presumably Vandercliff Street) – although its precise location is unknown (MCC August 16, 1750 Vol. 5:300). By 1755

the section of Gold Street between Fulton and Frankfort Streets, was laid out (Stokes Vol. VI. 1928:594). That same year, Gold Street west of Beekman Street was regulated at a descent of 18'8" for the length of the street – then 300' long – which amounted to a pitch of 7 ½' per every ten feet (MCC September 8, 1755 Vol. 6:26).

By 1744, Gold Street had still not yet been laid out between Fulton and Ann Streets, and there were several structures in its proposed route directly east of Fulton Street (Grim 1813; Figure 11). By 1766/67 it had been cut through between these two cross streets (Ratzer 1766/67; Figure 12). Plans and specifications for regulating sections of the road were adopted in 1791, and in 1792 it was widened and improved from Beekman to John Street, including the segment in the APE (MCC May 25, 1792, Vol. I:720). At that time the road was regraded to ascend from Beekman to Fulton Street at the rate of 3¼" per each 10', lowering it by one foot and five inches (1'5") at Ann Street. It was also to ascend at a rate of 2" for every 10' for a distance of 274', where it was to be lowered by two foot four inches (2'4"). Finally, it was to descend to John Street with a pitch of 1 ¼" for every 10' (Ibid.). A petition was made to widen and straighten Gold Street between Fulton and Beekman Streets in 1819 (MCC October 4, 1819 Vol. 10:564). It was again widened and improved from Fulton to Frankfort Street on February 25, 1834 (Street Books, Manhattan Borough President's Office). On its south side, between John and Fulton Street, stood the meetinghouse of the First Baptist Church; a plain stone edifice enlarged three years after its first construction (measuring 52' by 42'), which stood through 1840 (Ibid.). When it was razed, some of the stone was reportedly removed and used for the construction of a new meetinghouse at Broome and Elizabeth Streets, far outside the Corridor Streetbeds APE.

In 1966 Gold Street was widened to 54' between Fulton and Beekman Streets; 80' including sidewalks. This was accomplished by expanding the southern half of the street roughly 30' over former City Block 94 between Fulton and Beekman Streets (*Map Acc No. 29832* 1966, MBPO). However, it should be noted that all of the buildings fronting Gold Street prior to this event were four- and five-story buildings with basements (Sanborn 1951). A recent archaeological assessment of Block 94, bounded by Fulton, Ann, Gold, and Cliff Streets, concluded that there was no archaeological potential from the surface down to 10' below grade due to the depths of prior basements (Historical Perspectives Inc., 2006:37).

William Street between Maiden Lane and Beekman Street

William Street was laid out in ca.1656 west of the APE, and between Maiden Lane and Ann Street in 1690. It was called King George Street prior to 1755 (Smith 1900:37; Innes 1902:233; MCC 1792 Vol. I:720; Stokes Vol. III 1918:1003). In 1748 the Common Council ordered a well sunk and another filled somewhere near the intersection of John and William Streets at the expense of the neighborhood, (MCC 1748 Vol. I:394). Furthermore, a pump was ordered removed from somewhere on William Street in 1805 (MCC 1805 Vol. VI:114).

On the southern side of William Street between what are now John and Fulton Streets, a low wooden sail maker's workshop reportedly stood in 1767 (Mercantile Library Association 1861:22). Prior to that, the structure served as the first public meeting place of the First Baptist Church, and the First Methodist Church (Ibid.).

In 1755 William Street was regulated from Beekman to George Street, east of the APE (MCC September 8, 1755 Vol. 6:26). In 1769 additional portions of the road west of Beekman's Swamp were regulated (Stokes Vol. III 1918:1003; MCC September 27, 1769 Vol. 7:181). In 1771 John Emott and Hugh Ross were paid for digging out "550 loads of ground" from King George Street in the Montgomery Ward, and shortly thereafter, it was regulated (MCC October 24, 1771 Vol. 7:323; November 21, 1771 Vol. 7:330). In 1788 an ordinance was passed for the paving of William Street between John and Fulton Street (MCC September 17, 1788 Vol. I:400). The following year, another ordinance was passed to regulate and pave William Street from Fulton Street to Beekman Street (Street Books MBPO). In 1792 William Street was regulated from Beekman Street to Thomas Street, descending from Beekman Street (Stokes Vol. III 1918:1003).

In 1835 it was resolved that William Street should be widened to 50' and 60' from Maiden Lane to Pearl Street (where William intersects, far southwest of the Streetbeds APE); concurrently, it was straightened to some degree (Street Books MBPO; Stokes Vol. VI 1928:602). In 1845 the street was reduced in elevation by 1'3" between John Street and Fulton Street, in order to reduce the elevation of a peak between the two streets (located at a point 167' northeast of John Street (MCC February 26, 1845 Vol. III:270).

Nassau Street between Maiden Lane and Spruce Street

Nassau Street was surveyed and laid out in May of 1689 south of Maiden Lane, and north of this was laid out as Kips Street in 1699 (Stokes Vol. VI 1928:597; Carwitham 1740; Lyne 1730; Figures 9 and 10). A section of the road was officially regulated in 1755, and in 1767 the name Nassau Street was applied to its length (Stokes Vol. VI 1928:596). The road was regulated and paved in 1790 (Ibid.:598). At that time, regulating the street was undertaken so that it would ascend from Maiden Lane roughly 3 ½" per every 10' to the intersection of John Street, and then 2" for each 10' from John to Fulton Street. From Fulton east, Nassau Street was to ascend 1" on every 10 feet to a distance of 55' from Fulton, then descending 1 ½' for every 10' to opposite Ann Street. From this point east it was to descend 1 1/3' per every 10' to the intersection of Beekman Street (MCC July 23, 1790 Vol. 6:567).

On the southern side of Nassau Street near John Street, was the new meeting house of the German Reformed Church (Mercantile Library Association 1861:24). The building reportedly stood from the 1770s through the 1850s (Ibid.). In 1727 a well was filled and another ordered to be dug somewhere on Kip Street (MCC April 25, 1787 Vol. 3:408). In 1748 a new well was dug near the intersection of John and Nassau Streets, although its exact location is unknown (MCC May 4, 1748 Vol. 5:223). On the southeastern corner of Fulton and William Street, the North Dutch Church was constructed in 1767. When Nassau Street was widened in the 1790s, the fence in front of the church was removed (Stokes Vol. VI 1928:598). Nassau Street was widened again and opened from Maiden Lane to Cedar Street in 1827 (Street Books MBPO).

All Streets

The following table summarizes the earliest known dates and widths of streets in the Corridor Streetbed APE, and the locations and dates of their widening (see Table 3 below).

TABLE 3: CHANGES TO STREET WIDTHS IN CORRIDOR STREETBEDS APE

INTERSECTION	DATE LAID OUT[3]	ORIG. WIDTH	WIDTH (DATE AND LOCATION OF WIDENING)	1894 WIDTH	MODERN WIDTH -- WITH SIDEWALK[4]	CHANGE IN WIDTH
Pearl, Maiden to Fletcher	<1660	30'	38.6' (1835)	46'	46'	16'
Pearl, Fletcher to John	<1660	30'	51.25' (1831 @ John) 45' (1835 @ Maiden)	51.6'	51.5'	21.5'
Pearl, John to Fulton	<1660	30'	42.4' (1831)	49' (John) 38' (Fulton)	50.6'-38.9'	8' to 19'
Cliff, John to Fulton	1665	? (farm lane)	45'- 48' (1835) north side	44'-48'	45'-48'	?
Gold, John to Fulton	<1730	?	23.4' (1831)	24'	24'	.6'
Gold, Fulton to Ann	1744-1766	?	25.4' (1835) 80' (1966) south side	50'	80'	54.6'
Gold, Ann to Beekman	<1730	?	24.9' (1829) 80' (1966) south side	48.6'-51'	80'	23.7' to 26.1'
William, Maiden to John	1690	?	36' (1831) 40' (1846) north side	40'	40'	4'
William John to Fulton	1690	?	35' (1831) 40' (1846) north side	40'	40'	5'
William, Fulton to Ann	1690	?	40' (1846) north side	40'	40'	?
William, Ann to Beekman	1690	?	40' (1846) north side	40'	40'	?
Nassau, Maiden to John	1699	?	?	35'	40'	5'
Nassau, John to Fulton	1699	?	?	36'	40'	4'
Nassau, Fulton to Ann	1699	?	35-37' (1829)	41'	40'	3' to 5'
Nassau, Ann to Beekman	1699	?	37' (1829)	40.6'	40'	3'
Nassau, Beekman to Spruce	1699	?	39-40' (1829)	40.6'	40'	1'
John, South to Front	1835	139.1'-140' (slip)	N/A	142' (whole slip)	60' (street)	-
John, Front to Water	1835	83.6'	N/A	83.6'	55'	-28.6'
John, Water to Pearl	1760	80'	N/A	70.6'	70'	-.6'
John, Pearl to Cliff	1655	12'-17'	28' (1797) both sides 45' (1836) both sides	46-44.6'	45'	28' to 33'
John, Cliff to Gold	1690	40'	45' (1836) both sides	45'	45'	5'
John, Gold to William	1690	40'	45' (1836) both sides	45'	45'	5'
Fulton, Water to Pearl	1767-1789	?	48.3' (1835)	100'; 47.6'	100'	51.7'
Fulton, Pearl to Cliff	1815-1818	31'	48.2' (1835) 90' (1966) east side	48.6'	90'	59'
Fulton, Cliff to Gold	1690	40'	55' (1835) both sides 90' (1966) east side	49' Cliff to Ryders 58' Ryders to Gold	90'	50'
Fulton, Gold to William	1690	40'	55' (1835) west side	54.6'	54-58'	14.6' to 18'
Fulton, William to Dutch	1690	40'	55' (1835) west side	58.6'	54'	14'
Fulton, Dutch to Nassau	1690	40'	55' (1835) west side	54'	54'	14'
Fulton, Nassau to B'way	1690	40'	55' (1835) west side	54'	54'	14'
Fulton, B'way to Church	ca. 1750	40	58' (1780s) 54' (1835)	54'	54'	14'

[3] Sources: Manhattan Borough President's Office, Topographic Bureau; Stokes *Iconography of Manhattan Island*, and Minutes of the Common Council (MCC), Street Openings – see Bibliography.
[4] Sources: Manhattan Borough President's Office, Topographic Bureau Map Acc. # 7090, nd., 2005 Sanborn.

Historical Resources in the Vicinity

The area surrounding the Corridor Streetbeds encompasses a rich architectural and archaeological heritage. Part of the APE is located adjacent to the South Street Seaport Historic District, which is a New York City Landmark (NYCL) and is listed on the State and National Registers of Historic Places (S/NR). The following is a summary of the historic structures and archaeological resources previously identified in or adjacent to the APE.

Fulton Street Transit Center. In 2003 and 2005 a Phase IA study was completed for the Fulton Street Transit Center (FSTC), encompassing part of the Corridor Streetbeds APE including Fulton Street from a point just south of William Street north to Broadway, William Street between Ann Street and John Street, and, a small segment of John Street due south of William Street (Geismar 2003; Berger 2004). The report identified specific resource types that were anticipated in the FSTC and Fulton Corridor APE (Geismar 2003:23; Berger 2004:40). These include:

- Street or Sidewalk Vaults;
- Historic Building Footprints;
- Historic Sewer and Water Mains (particularly bored-out log mains);
- Historic hydrants; Wells;
- Pumps; and,
- Cisterns.

A map of potential cultural resources was prepared, indicating that Fulton, William, and John Streets are sensitive for these potential resource types in discrete locations (Berger 2004:Figure 1B; see Figure 16 of this report).

Fulton Street Transit Center: Maiden Lane and Broadway. Recent utility excavations as part of the FSTC project at the intersection of Maiden Lane and Broadway, two blocks west of the APE, revealed evidence of a brick and stone foundation that was evaluated by archaeologist Geismar (Geismar 2005b:1-4). The 8' to 9' deep foundation wall was found to be a supporting structure of a mid-19th century building that had been razed in 1901-1902. When a new building was constructed on the site, it left the underlying street vault partially undisturbed (Ibid.).

Schermerhorn Row. Block 74, on the west side of Fulton Street south of Front Street (about 200' south of the Corridor Streetbeds APE), encompasses what is known as the Schermerhorn Row Block. The site is a NYCL and is S/NR listed, as well as being located within the boundaries of the South Street Seaport Historic District. As part of the archaeological study of the Schermerhorn Row Block, Kardas and Larrabee undertook an extensive review of fill retaining structures utilized in Manhattan dating from the 17th through 19th centuries to understand the fill-retaining devices that could be identified on the block (Kardas and Larrabee 1991:26). Their analysis of changes in the types of fill-retaining devices utilized over time concluded that 17th through mid-18th century structures tended to be wooden, and used more logs. These were frequently placed in horizontal layers, with each layer at a right angle to the one below it, and they exhibited "great variability in design and execution" (Ibid.).

Kardas and Larrabee report that in the late 18th century and early 19th century more open "cell-like" structures with modules were employed, as these could be easily assembled as needed (Ibid.). A solid layer or platform of logs created a floor, and "above these was an open grid of logs running in alternate directions, notched or fastened together with some cross bracing" (Ibid.:26). In the second quarter of the 19th century, steam-powered pile drivers enabled advances in waterfront construction. Long vertical pilings could be driven to further depths than were previously allowed.

At the Schermerhorn Row site, both primary landfill and cribbing dating to the early 18th century were found. The fill retaining structure was constructed with large logs, up to one foot in diameter, laid in alternating directions for each layer in order to provide cribbing. The landfill consisted of large and medium-sized rocks placed around and over the cribwork. Within this was a dark gray to black muck with clay, topped by a thin lens of oyster shell in black muck in several locations (Kardas and Larrabee 1991:277). Mixed in the fill was a large quantity of cut leather, possibility originating from the tanneries that once stood north of Pearl Slip in the early 18th century. On top of the timber cribbing - which was estimated to be about 20 feet square and 20 feet deep - was a stratum of reddish brown soil, designated as secondary fill, which was presumably placed directly after stone foundations were built (Ibid.:278). Final fill levels were encountered within cellars, and represented discrete deposits within each structure that once stood on the block (Ibid.:280). The water level varied, but was generally encountered at about six to seven feet below grade in the dark gray/black sandy silty muck of the primary landfill (Ibid.:279).

A table summarizing the results of the archaeological investigation of the Schermerhorn Row block found the stratigraphy generally as follows:

- From plus 5 feet to plus 2 feet is the first level of fill dating to post-1810. This varied between and within structures.
- Beneath this was secondary fill from ca. plus 2 feet to 0 feet, dating to 1810-1812. This is reddish brown sand with lenses of brick and mortar with many artifact deposits.
- Primary landfill was found beneath this from ca. 0 feet to -10 feet on the west side of the block, and 0 feet to -20 feet on the east side of the block (Ibid.). This period of fill dates from ca.1800-10, and includes rocks and cribbing (sunk or pushed into a level of organic silty clay).

(Kardas and Larrabee 1991:282 – Table 3, Major Stratigraphic Units).

175 Water Street. In their early 1980s study of the 175 Water Street site (Block 71), which is bounded by Burling Slip, and Water, Front, and Fletcher Streets adjacent but outside of the Corridor Streetbeds APE, Soil Systems, Inc. (1981,1983) concluded that this block was filled between 1730 and 1766-67. Archaeological deposits, including the remnants of shaft features, were found within inches beneath the foundations of structures which stood on the block in the 19th and 20th centuries (Soil Systems Inc. 1983:81). Domestic and commercial deposits were found in 57 distinct features that included privies, cisterns, drains, barrels, yard pits, and builder's trenches (Ibid.:370). The roughly 310,000 artifacts and voluminous faunal and architectural material recovered from the site yielded tremendous information about landfilling, neighborhood development, and the site's 19th century mercantile shift (Ibid.:848).

Despite historic documents indicating that filling was completed by 1755-56, the archaeological study concluded that filling was, in fact, a continual process that was probably started sometime after 1730 and was completed sometime after 1754 but before 1766-67 (Soil Systems Inc. 1983:692).

The archaeological study of this block found that the process of land filling was complex and iterative; numerous primary and secondary fill episodes support this. Primary fill was noted as "trash and harbor-related accumulation" (Soil Systems Inc. 1983:706). Its matrix was composed of black to gray silt and sands, replete with cultural material. The presence of a ca. 1720 merchant ship, dubbed the *Ronson*, and wharf/grillage[5] provided evidence of retaining devices employed to create the block (Ibid.:685, 702). Secondary filling in a subsequently built cofferdam box, dated to ca.1790-1820, was believed to have been employed to eliminate stagnant water, a venue for mosquito breeding in the summer months (Ibid.:693).

Telco Block. In a documentary study of Block 74W, the Telco Block, located between John, Front, Fulton, and Water Streets, immediately adjacent to the Corridor Streetbeds APE, the earliest episode of filling was found to date between 1732 and 1735 (Soil Systems Inc. 1980:42). This block lies within the S/NR-listed boundaries of the South Street Seaport Historic District, but not the boundaries of the NYCL district (Soil Systems 1982:2). Deeds, maps, and water grants were tracked through the 18th and 19th centuries to establish potential filling episodes, which continued for several decades (Ibid.:43). Excavations found numerous brick, stone, and wood features indicative of 18th century waterfront use. A final level of red-brown sandy silt was found underlying the fill (Ibid.). Fill and wharf sections extended to 15 feet below grade.

209 Water Street. At the 209 Water Street site, located on the block between Water, Front, Beekman, and Fulton Streets – immediately southeast of the APE – the partial remains of a ship were excavated (Henn 1978:3). Initially, wooden cribbing was encountered, but further investigations found this to be the frame of an 18th century ship (Ibid.). The outer hull of the ship was identified by the presence of horsehair and tar, applied to prohibit worm infestation. The lack of metal objects on the ship suggested that it was stripped of reusable material prior to sinking or abandonment (Ibid.:4). It is postulated that the ship was sunk as fill or to function as cribbing during the filling process. The ship apparently extended eastward and, if intact, may actually lie, in part, beneath Water Street on the block north of Fulton Street (Ibid.). Filling at the site was dated to the period between 1755 and 1767.

Beekman Street Roadbed. Recent archaeological monitoring by Alyssa Loorya of Chrysalis Archaeological Consultants in Lower Manhattan – on Beekman Street between Water and Pearl Streets (within the South Street Seaport Historic District), immediately east of the Corridor Streetbeds APE – has found that the top two feet of the street corridor lack archaeological potential due to disturbance from the creation of the roadbed (personal communication, Cece Saunders, September 12, 2006). Monitoring has also found deposits, or pockets, of historical artifacts between and around existing utility trenches that run beneath the two feet of disturbance. The precise nature and depositional history of these materials have yet to be

[5] Grillage, or a raft wharf, is made of several alternating courses of headers and stretchers (cross-layered) that are weighted with stone. Rafts are stacked atop each other to form a block which is then sunk.

interpreted. Loorya has also identified undisturbed deposits/features, but these have been recovered at approximately eight feet below grade.

Assay Site. Although the Assay Site is not in proximity to the Corridor Streetbeds APE, a discussion of the results of research are included in this report as it, too contained similar resource types potentially anticipate from the Corridor Streetbeds APE. The Assay Site is located approximately nine blocks to the southwest. Documentary research and soil testing concluded that cultural levels extend from the surface down to between 27 and 30 feet below grade on the western end of the block near Front Street, and between 33 and 37 feet below grade at the eastern end of the block near South Street (Greenhouse 1983:25). Levels of fill and timber were observed in soil borings taken directly south of Gouverneur Lane. The deepest cultural levels of clay, mud, and fill were found to be consistent with still or backwater sediments produced by slower currents, such as those in and around piers, slips, and jetties (Ibid.:26). Directly beneath this were levels of coarse sand and sandy clay, interpreted as river bottom that was "probably sterile" (Ibid.:26).

31 Pearl Street. In lower Manhattan, archaeological research at Block 31, bounded by Pearl, Wall, and Water Streets – about five blocks southwest of the APE - revealed that the site possessed landfill associated with a series of water lot grants dating to 1694-95, and some of the earliest commercial activities associated with the waterfront in that area. By the middle of the 18th century and into the early 19th century, the block was of mixed residential use, with a cluster of chemist/druggists, artists, and small scale merchants (Louis Berger & Associates 1987:11). The block was eventually used by brokerages and for warehousing; by the 1820s it was entirely commercial. Stage I testing performed at the site exposed extensive yard deposits, middens, privies, wells, cisterns, and house and outbuilding foundations. The rear yard areas were concentrated within the center of the block. Deposits along the street fronts were destroyed by late-19th- and 20th-century construction. Most of the deposits dated between 1780 and 1820. Homelot and commercial activities were reflected in the archaeological deposits (Louis Berger & Associates 1987:4).

Historical Archaeological Potential

Much of the Corridor Streetbeds APE has been disturbed by modern road construction, modern utility installation, subway construction, and building episodes where the APE crosses former City lots. The roadbeds and sidewalks, however, still have areas that may not have experienced modern disturbances and may be sensitive for historical period archaeological resources. The resource types identified for the roads and sidewalks in the FSTC APE are applicable to the Corridor Streetbeds APE (Geismar 2003; Berger 2004). Namely, potential resources are likely to include:

- Street or Sidewalk Vaults;
- Historic Building Footprints;
- Historic Sewer and Water Mains (particularly bored-out log pipes);
- Historic hydrants;
- Wells;
- Pumps; and,

- Cisterns.

In addition, there are locations where streets and sidewalks cross former City lots that were developed in the early 19th, and possibly 18th centuries. These locations may also be sensitive for domestic lot features such as wells, privies, and cisterns. In addition to potential shaft features, sidewalk vaults are commonly constructed in front of buildings beneath the sidewalk. These serve as access to basements, and would have disturbed any earlier potential features.

Street corridor resources related to Manhattan's early infrastructure are anticipated in undisturbed sections of the Corridor Streetbeds APE. Prior to the introduction of Croton water in 1842, water was distributed in mains composed of hollowed-out logs, replaced with cast iron pipes and hydrants beginning in 1827. The Manhattan Company maintained numerous mains in Lower Manhattan during its existence from 1799 to 1842. The wooden mains were shallowly buried so that they could be tapped by firemen in the course of their duties, and were most recently encountered within four feet of the surface in Coenties Slip, west of the APE (Geismar 2005a:1-3).

Historical archaeological resources relating to dwellings and commercial structures are often preserved in privies, cisterns, wells and cesspools, which in the days before the construction of municipal services - namely sewers and a public water supply - were an inevitable part of daily life. Prior to the availability of potable water, hand-excavated wells were dug to serve individual or multiple lots, and sometimes even neighborhoods. Another measure undertaken to provide water for household use was through the collection of run-off from house roofs during rainstorms. Water was collected in cisterns or barrels, and used for purposes not requiring potable water, such as washing (Kieran 1959:31). Also, without piped water to accommodate flush toilets, privies were necessary and these were commonly situated in back yards, and sometimes these were drained into a communal cesspool.

Noxious conditions in the 19th century inspired ordinances regulating the depth and cleaning of privies. A city ordinance passed in 1823 required that privy vaults be constructed of stone or brick, although earlier ones were occasionally constructed of wood. They were also required to extend at least five feet below ground surface (Goldman 1988:45). Lime was placed in vaults to counteract some of the noxious gases, and the contents were required to be emptied periodically. After sewer pipes were installed in the street beds, water closet connections to the sewer system were utilized (Ibid.:64). In some cases, earlier privies were retrofitted with sewer pipes to allow for the new system of flush toilets. In 1856 an ordinance was passed requiring that new construction be limited to lots served by sewers "unless a sink or privy was erected" (Ibid.:72). Buildings constructed on lots without sewers were required to connect their sinks, privies, cesspools or water closets to a sewer so that they could be flushed clean (Ibid.).

Sewer and water pipes were installed throughout the streets of Manhattan at different times, with more affluent areas serviced first (Goldman 1988:36). Between 1846 and 1855, sewers extended uptown to 60th Street on Broadway, and downtown to the Battery, from the East River to the Hudson (Ibid.). In 1834 water pipes were present on Fulton Street as evidenced by the fire hydrants mapped along its route between Water Street and Broadway (Firemen's Guide 1834). John Street had hydrants mapped at Cliff, Gold, and William Streets (Ibid.). In the Corridor

Streetbeds APE, only Cliff and Gold Streets lacked mapped hydrants (Ibid.). In the 1840s the Croton Water System was being constructed, and in 1842 water pipes are mapped along every streetbed in the APE (Endicott 1842). Although water pipes were clearly present around the APE in 1842, it is probable that municipal water was available at an earlier date, but not predating 1799. According to the Aqueduct Commissioners Report of 1857, new sewer pipes were laid in many of the APE streets in the 1840s and 50s:

- Fulton Street between Nassau Street and the East River in 1847; between Nassau Street and Broadway in 1849; and between Broadway and Church Street in 1851 (1857:120);
- John Street between Pearl Street and Broadway 1847 (Ibid.:123);
- Pearl Street between Fletcher and John Streets in 1848 (Ibid.:126);
- Cliff Street between Fulton and Beekman Streets in 1847 (Ibid.:118);
- Gold Street between Fulton and Beekman Streets in 1851 (Ibid.:120);
- William Street between Maiden Lane and John Street in 1847; between Fulton and Beekman Streets in 1848; and between John and Fulton Streets in 1849 (Ibid.:129); and,
- Nassau Street between Maiden Lane and Fulton Street in 1849; and between Ann and Beekman Streets in 1852 (Ibid.:125).

Shaft features predating these utilities, are potentially in sections of the APE that cross former City lots. The potential depth of shaft features in the APE would be varied, and depends, in part, on the subsurface conditions at the time they were excavated. Wells would have been excavated at least as deep as the water table, and possibly deeper to access potable water. For example, once the water from the Collect Pond in Lower Manhattan was no longer potable, having been declared "stagnant and mephitic" in 1796, deeper wells were dug throughout the city to access clean water (Kieran 1959:31). At Bleecker Street near Broadway, in 1832, a well was bored to a depth of 448', of which 400' was through solid rock (Ibid.). This however, was not the typical depth for wells hand-excavated in backyards throughout the city prior to the availability of high pressure steam engines (ca.1815) which allowed for deep drilling. These would typically have extended through soil to the water table, at whatever depth that was encountered, and possibly deeper to access a more steady supply of cleaner water.

The anticipated depth of privies is also difficult to estimate, given that subsurface conditions, such as soil permeability and the number of households served would have affected the size and depth of vaults. Geismar notes that a possible privy identified at 17 State Street extended 13' below the grade that existed at the time it was constructed, and that this depth coincided with the depth of a privy excavated at the Augustine Heerman warehouse site on the block bounded by Whitehall, Broad, Bridge, and Pearl Streets, also in Lower Manhattan (Geismar 1986:44). As noted above, by 1823 they were required to be at least five feet deep (Goldman 1988:45).

The following locations in the Corridor Streetbeds APE have been identified as sensitive for potential historical archaeological resources (see Figure 18). In addition to the potential resources listed below, previous studies in the immediate vicinity have concluded that there is also the potential to encounter unmapped municipal and neighborhood wells, hydrants, and pumps in the streets and beneath sidewalks where prior disturbance has not eradicated all archaeological potential (Geismar 2003; Berger 2004).

TABLE 4: HISTORICAL ARCHAEOLOGICAL POTENTIAL IN THE CORRIDOR STREETBEDS APE

LOCATION	POTENTIAL RESOURCE TYPE AND LOCATION	POTENTIAL DEPTH
Pearl, Maiden to Fletcher	Street and sidewalk: late-17th to early-19th c. domestic features pre-1835 16' width on both sides; wood mains 1799-1827; sidewalk vaults; street cisterns	3'+ below grade
Pearl, Fletcher to John	Street and sidewalk: late-17th to early-19th c. domestic features pre-1835 21' width on both sides; wood mains 1799-1827; sidewalk vaults; street cisterns	3'+ below grade
Pearl, John to Fulton	Street and sidewalk: late-17th to early-19th c. domestic features pre-1835 19' width on both sides; wood mains 1799-1827; sidewalk vaults; street cisterns	3'+ below grade
Cliff, John to Fulton	Street and sidewalk: ca.1655 Van Tienhoven House features. John x Cliff Street; early-18th to early 19th c. domestic features pre-1835 20' width on both sides; wood mains 1799-1827; sidewalk vaults; street cisterns	3'+ below grade
Gold, John to Fulton	Street and sidewalk: early-18th to early-19th c. domestic features pre-1835 probably 10' width on both sides; sidewalk vaults; street cisterns	3'+ below grade
Gold, Fulton to Ann	Street and sidewalk: early to mid-18th c. domestic features pre-1767; wood mains 1799-1827; post-1744 sidewalk vaults; street cisterns Sidewalk: early-18th to early-19th c. domestic features pre-1835 probably 10' width on north side **No potential resources < ca.10' below grade, southernmost 30' due to 19th-20th c. basements**	3'+ below grade
Gold, Ann to Beekman	Street and north sidewalk: early-18th to early-19th c. domestic features pre-1835 probably 10' width on north side; sidewalk vaults; street cisterns **No potential resources < ca.10' below grade, southernmost 30' due to 19th-20th c. basements**	3'+ below grade
William, Maiden to John	Sidewalk: early-18th to early-19th c. domestic features pre-1831 probably 10' on both sides and pre-1846 4' on north side; wood mains 1799-1827; sidewalk vaults; street cisterns - **outside subway tunnel only**	3'+ below sidewalk grade
William John to Fulton	Sidewalk: early-18th to early-19th c. domestic features pre-1831 probably 10' on both sides and pre-1846 4' on north side; wood mains 1799-1827; sidewalk vaults; street cisterns - **outside subway station and tunnel only**	3'+ below sidewalk grade
William, Fulton to Ann	Sidewalk: early-18th to early-19th c. domestic features pre-1846 probably 10' on both sides; wood mains 1799-1827; sidewalk vaults; street cisterns - **outside subway station and tunnel only**	3'+ below sidewalk grade
William, Ann to Beekman	Sidewalk: early-18th to early-19th c. domestic features pre-1846 probably 10' on both sides; wood mains 1799-1827; sidewalk vaults; street cisterns - **outside subway station and tunnel only**	3'+ below sidewalk grade
Nassau, Maiden to John	Sidewalk: early-18th to early-19th c. domestic features probably 10' on both sides; wood mains 1799-1827; sidewalk vaults; street cisterns - **outside subway tunnel only**	3'+ below sidewalk grade

LOCATION	POTENTIAL RESOURCE TYPE AND LOCATION	POTENTIAL DEPTH
Nassau, John to Fulton	Sidewalk: early-18th to early-19th c. domestic features probably 10' on both sides; wood mains 1799-1827; sidewalk vaults; street cisterns - **outside subway station and tunnel only**	3'+ below sidewalk grade
Nassau, Fulton to Ann	Sidewalk: early-18th to early-19th c. domestic features probably 10' on both sides; wood mains 1799-1827; sidewalk vaults; street cisterns - **outside subway station and tunnel only**	3'+ below sidewalk grade
Nassau, Ann to Beekman	Sidewalk: early-18th to early-19th c. domestic features probably 10' on both sides; wood mains 1799-1827; sidewalk vaults; street cisterns - **outside subway station and tunnel only**	3'+ below sidewalk grade
Nassau, Beekman to Spruce	Sidewalk: early-18th to early-19th c. domestic features probably 10' on both sides; wood mains 1799-1827; sidewalk vaults; street cisterns - **outside subway tunnel only**	3'+ below sidewalk grade
John, South to Front	Street and sidewalk: 19th century wharves, landfill and fill retaining devices ca.1835	3'+ below grade
John, Front to Water	Street and sidewalk: 19th century wharves, landfill and fill retaining devices ca.1835	3'+ below grade
John, Water to Pearl	Street and sidewalk: 18th century wharves, landfill and fill retaining devices ca.1760s	3'+ below grade
John, Pearl to Cliff	Street and sidewalk: ca.1655 Van Tienhoven House features, John x Cliff Street; early-18th to early 19th c. domestic features pre-1835 16' width on both sides; wood mains 1799-1827; sidewalk vaults; street cisterns	3'+ below sidewalk grade 5'+ below street grade
John, Cliff to Gold	Street and sidewalk: early-18th to early 19th c. domestic features pre-1836 5' width on both sides; wood mains 1799-1827; sidewalk vaults; street cisterns	3'+ below sidewalk grade 5'+ below street grade
John, Gold to William	Street and sidewalk: early-18th to early 19th c. domestic features pre-1836 5' width on both sides; wood mains 1799-1827; sidewalk vaults; street cisterns	3'+ below sidewalk grade 5'+ below street grade
Fulton, Water to Pearl	Street and sidewalk: ca.1720 wharves; landfill & fill retaining devices 1767-1789; wood mains 1799-1827; sidewalk vaults on both sides; street cisterns	3'+ below grade
Fulton, Pearl to Cliff	Street and sidewalk: early-18th to early-19th c. domestic features predating 1815; wood mains 1818-1842; sidewalk vaults; street cisterns **No potential resources < ca.10' below grade, easternmost 35' due to 19th-20th c. basements**	3'+ below grade
Fulton, Cliff to Gold	Street and sidewalk: 1799-1827 wood mains; sidewalk vaults; street cisterns Sidewalk: early-18th to early-19th c. domestic features pre-1835 10' width on west side; **No potential resources < ca.10' below grade, easternmost 35' due to 19th-20th c. basements**	3'+ below grade
Fulton, Gold to William	Street and sidewalk: early-18th to early-19th c. domestic features pre-1835 14'-18' width on west side; 1799-1827 wood mains; sidewalk vaults; street cisterns	3'+ below grade

LOCATION	POTENTIAL RESOURCE TYPE AND LOCATION	POTENTIAL DEPTH
Fulton, William to Dutch	Street and sidewalk: early-18th to early 19th c. domestic features pre-1835 14' width on west side; 1799-1827 wood mains; sidewalk vaults; street cisterns – **outside subway station only**	3'+ below grade
Fulton, Dutch to Nassau	Street and sidewalk: early-18th to early 19th c. domestic features pre-1835 14' width on west side; 1799-1827 wood mains; sidewalk vaults; street cisterns – **outside subway station only**	3'+ below grade
Fulton, Nassau to B'way	Street and sidewalk: early-18th to early 19th c. domestic features pre-1835 14' width on west side; 1799-1827 wood mains; sidewalk vaults; street cisterns – **outside subway stations and tunnels beneath Broadway only**	3'+ below grade
Fulton, B'way to Church	Street and sidewalk: early-18th to early 19th c. domestic features pre-1835 14' width on west side; 1799-1827 wood mains; sidewalk vaults; street cisterns	3'+ below grade

CORRIDOR STREETBEDS POTENTIAL IMPACTS

The proposed impacts to the Corridor Streetbeds APE will entail curb improvements and the installation of sidewalk furniture. Anticipated depths of subsurface disturbance are not yet determined.

CORRIDOR STREETBEDS CONCLUSIONS AND RECOMMENDATIONS

The Corridor Streetbeds APE has experienced extensive subsurface disturbance in many locations. Prior archaeological studies undertaken for projects in the immediate vicinity, including a portion of the Corridor Streetbeds APE, have concluded that there is extensive disturbance to much of the study area (Geismar 2003; Berger 2004; Historical Perspectives, Inc., 2003a; 2006). Based on these prior studies and a review of the documentary literature, it is estimated that roughly the upper three feet in the APE has been disturbed by multiple episodes of road regulating, paving, utility installation, and development. Furthermore, three subway lines run through the APE. Cut-and-cover construction of the tunnels and/or stations has caused extensive disturbance, eradicating the potential for any archaeological resources in their footprints.

Research has concluded that there is only the minimal potential for precontact archaeological resources in the APE, and if precontact deposits do exist in discrete locations, they would potentially be found where historical fill may have protected them from later disturbance (Figure 17). Specifically, it is possible that precontact resources may be found beneath roughly seven feet of fill at the intersection of Pearl and Fulton Streets, and beneath roughly five-and-a-half feet of fill near the intersection of Gold and Beekman Streets (Figure 17). The APE was also found to be potentially sensitive for historical archaeological deposits in specific locations (Figure 18). Resources potentially in the APE south of Pearl Street include historical fill, fill retaining devices, and wharves. North of Pearl Street potential resources include domestic features (e.g., wells, cisterns, and privies), infrastructure features (e.g., wood water pipes, pumps, street cisterns, and municipal wells), and structural features (e.g., sidewalk vaults and building footprints). Table 4 of this report summarizes resource potential, locations, and estimated depths.

If the proposed project will cause disturbance of three or more feet below grade where the APE has been designated as sensitive for historical archaeological deposits, or more than five to seven feet below grade where it has been designated as sensitive for precontact archaeological deposits, the proposed project may affect potential archaeological deposits. If these impacts cannot be avoided, then an archaeological field testing program should be designed in coordination with the SHPO and LPC.

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Figures

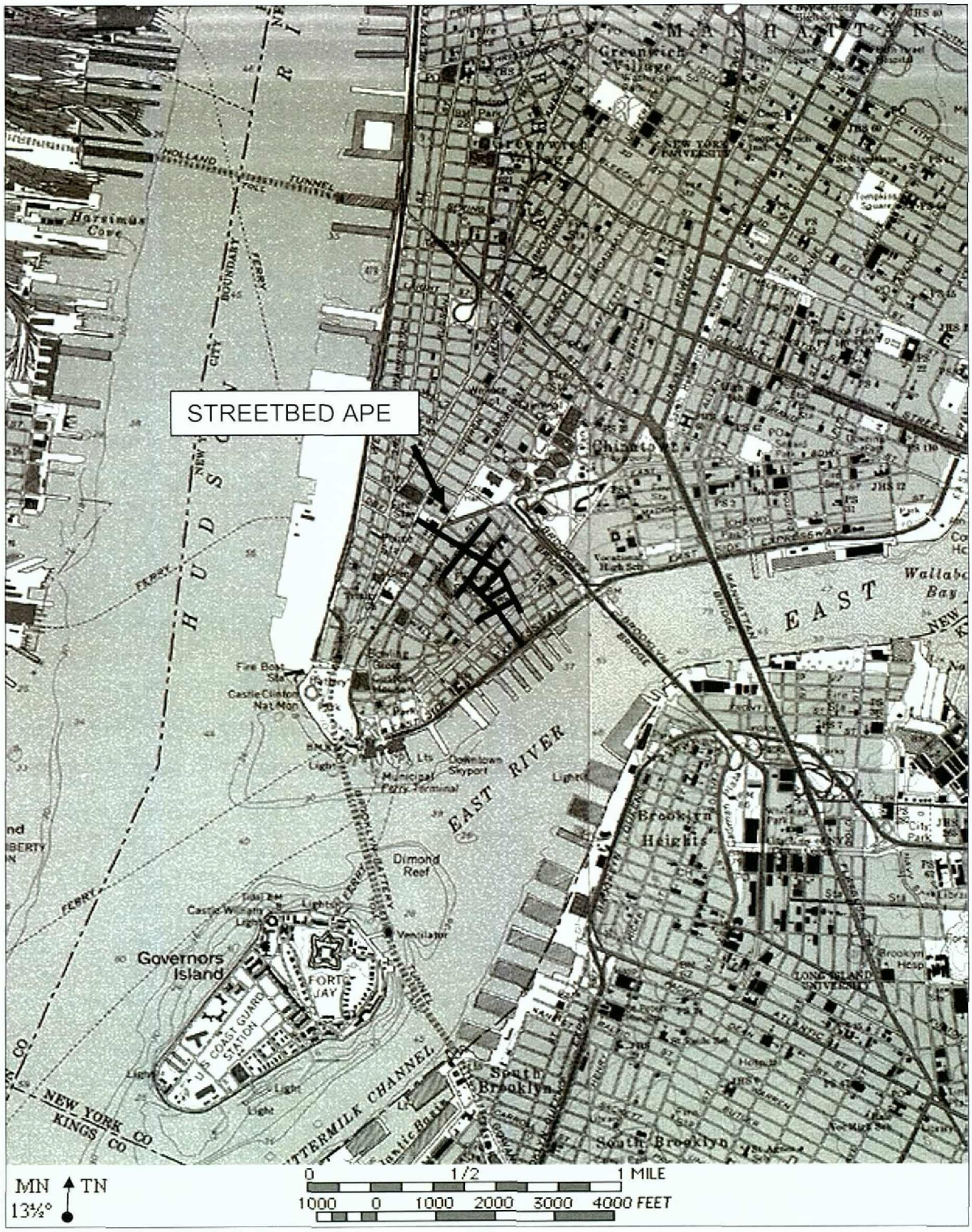


FIGURE 1

Streetbed APE. U.S.G.S. Jersey City, NJ and Brooklyn NY Quadrangles, 1979.

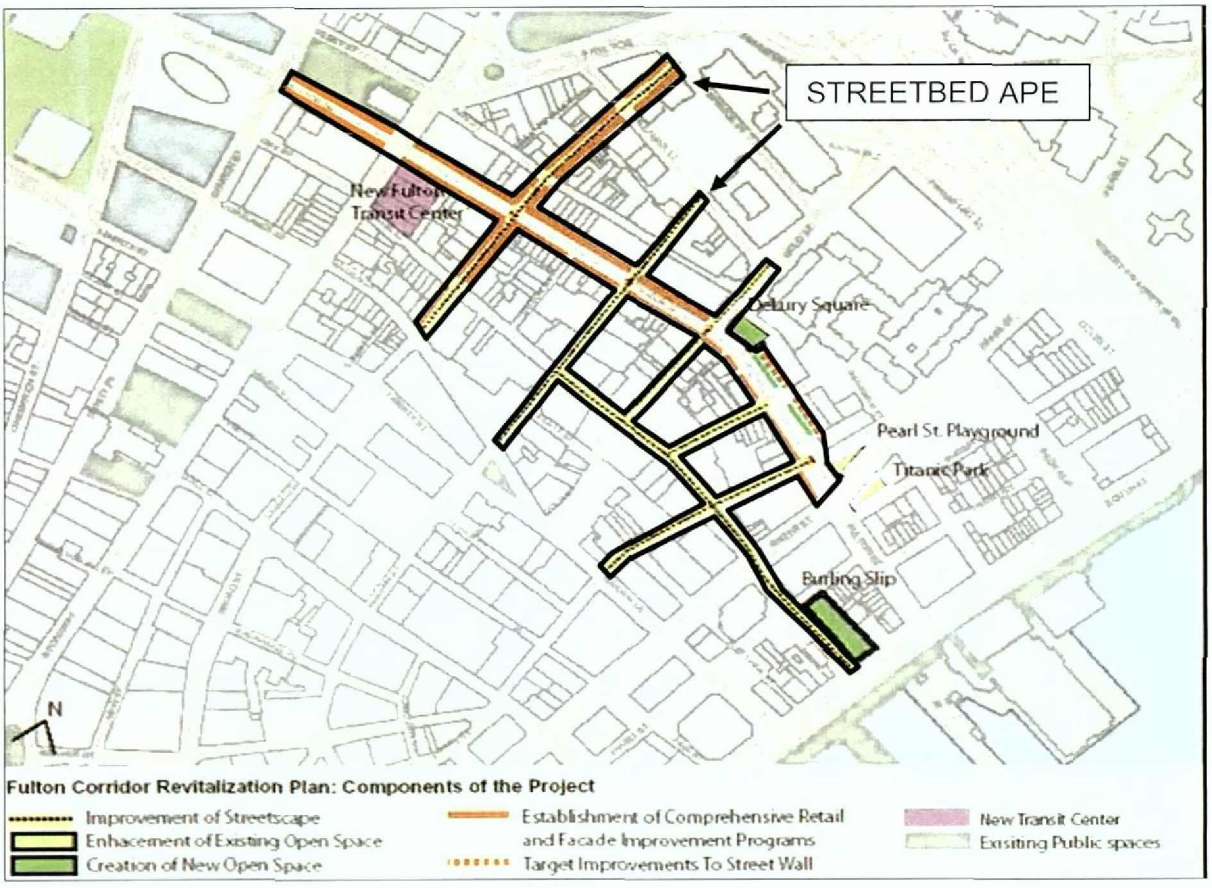


FIGURE 2

Streetbed Archaeological APE. Source: AKRF, Inc.

No Scale.

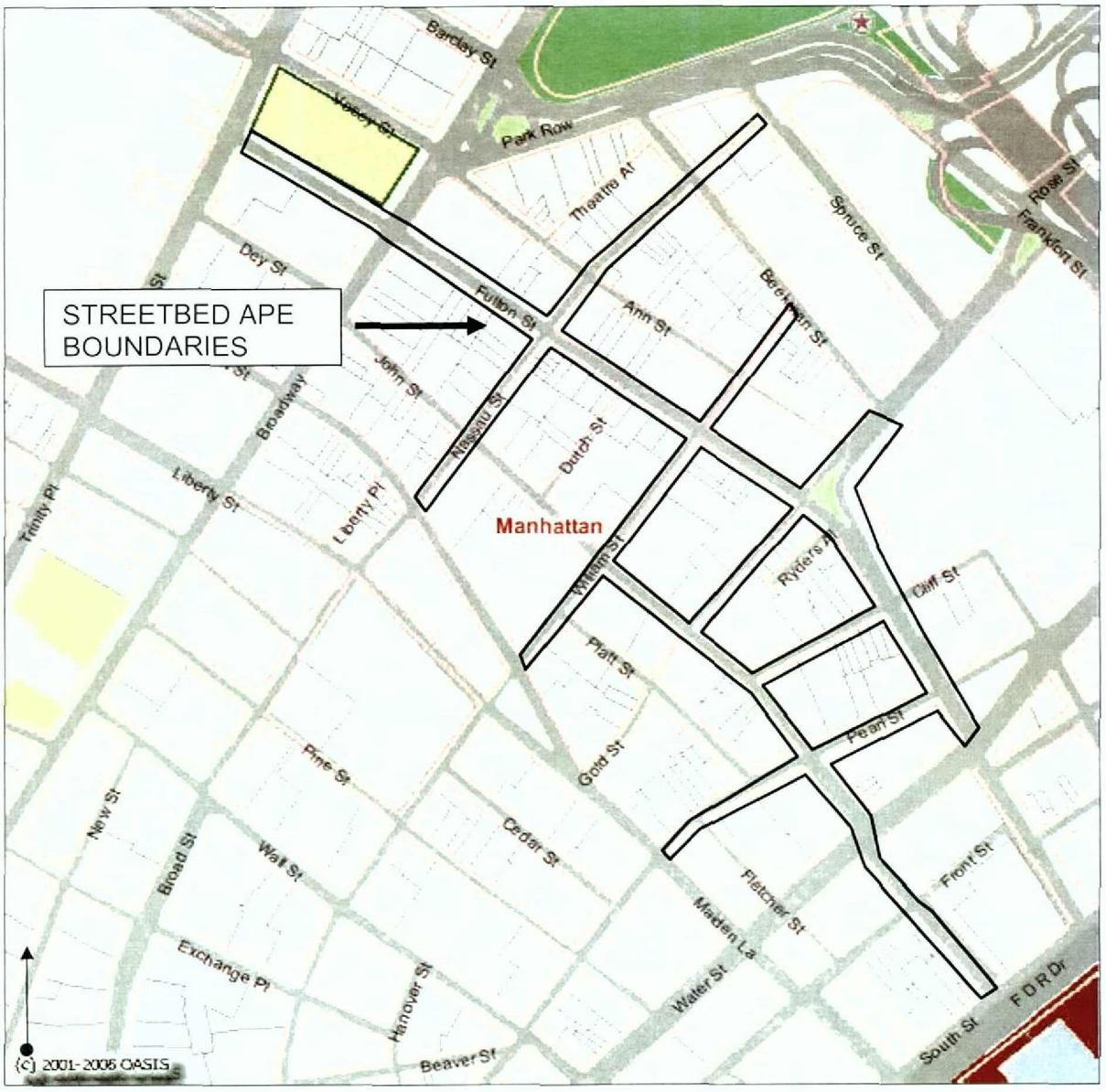


FIGURE 3

Corridor Streetbed APE Boundaries.

Base Map: NYC OASIS, 2007.

Approximate Scale: 1" = 400'

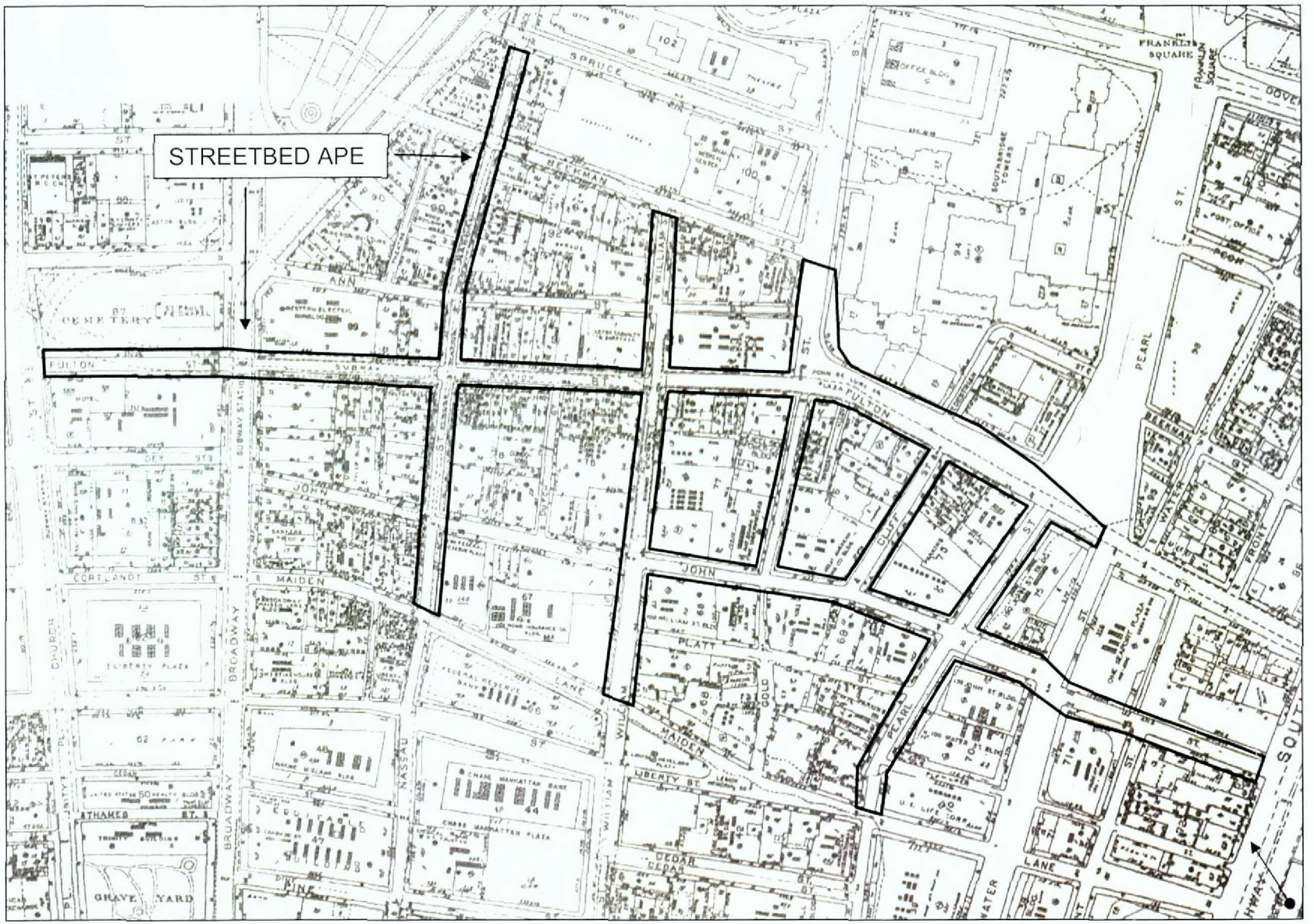


FIGURE 4

Insurance Maps of Manhattan. Sanborn 2005.

Approximate Scale: 1" = 320'

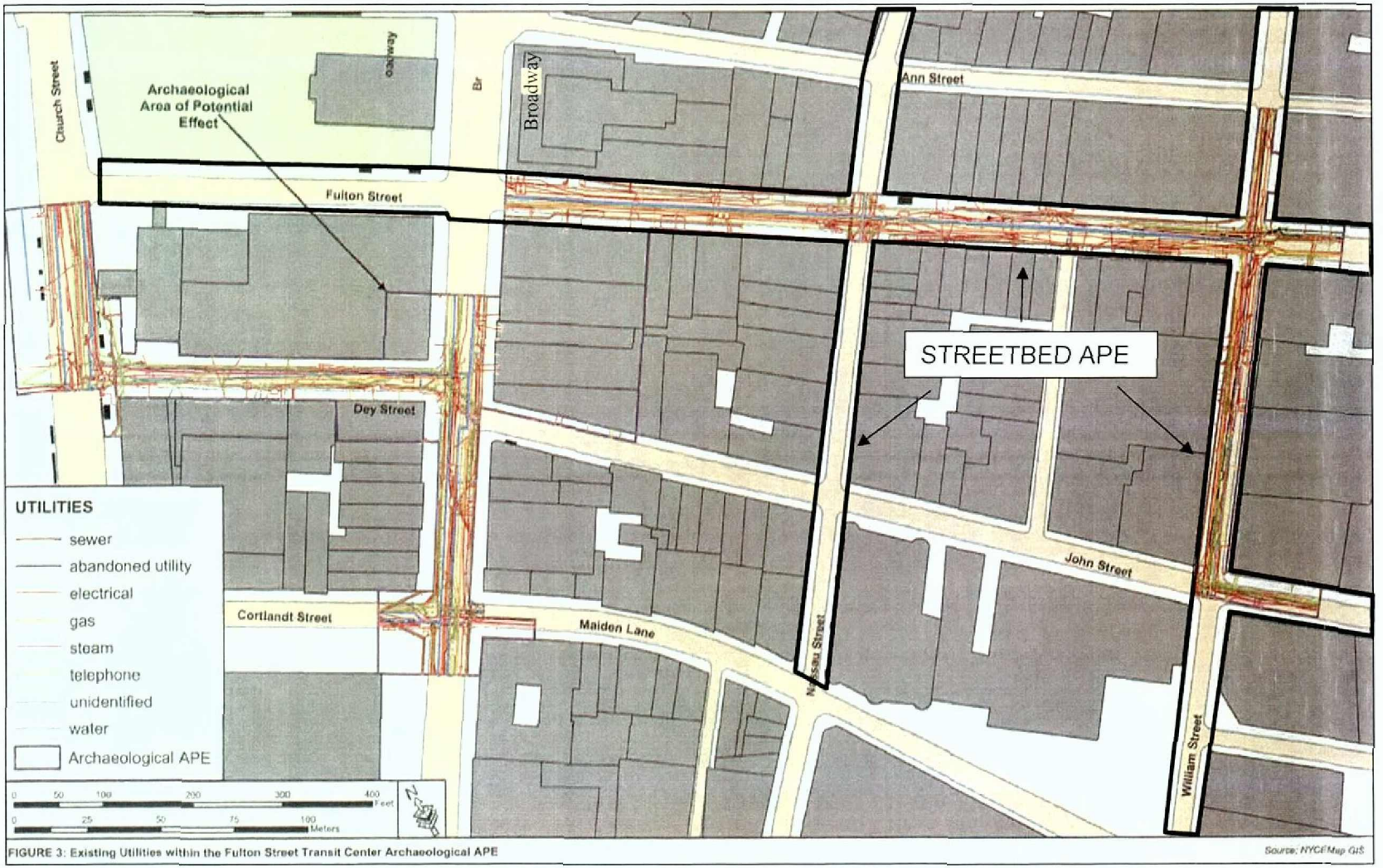


FIGURE 3: Existing Utilities within the Fulton Street Transit Center Archaeological APE

FIGURE 5

Existing Utilities within the Fulton Street Transit Center Archaeological APE. Figure 3 in Berger, 2004.

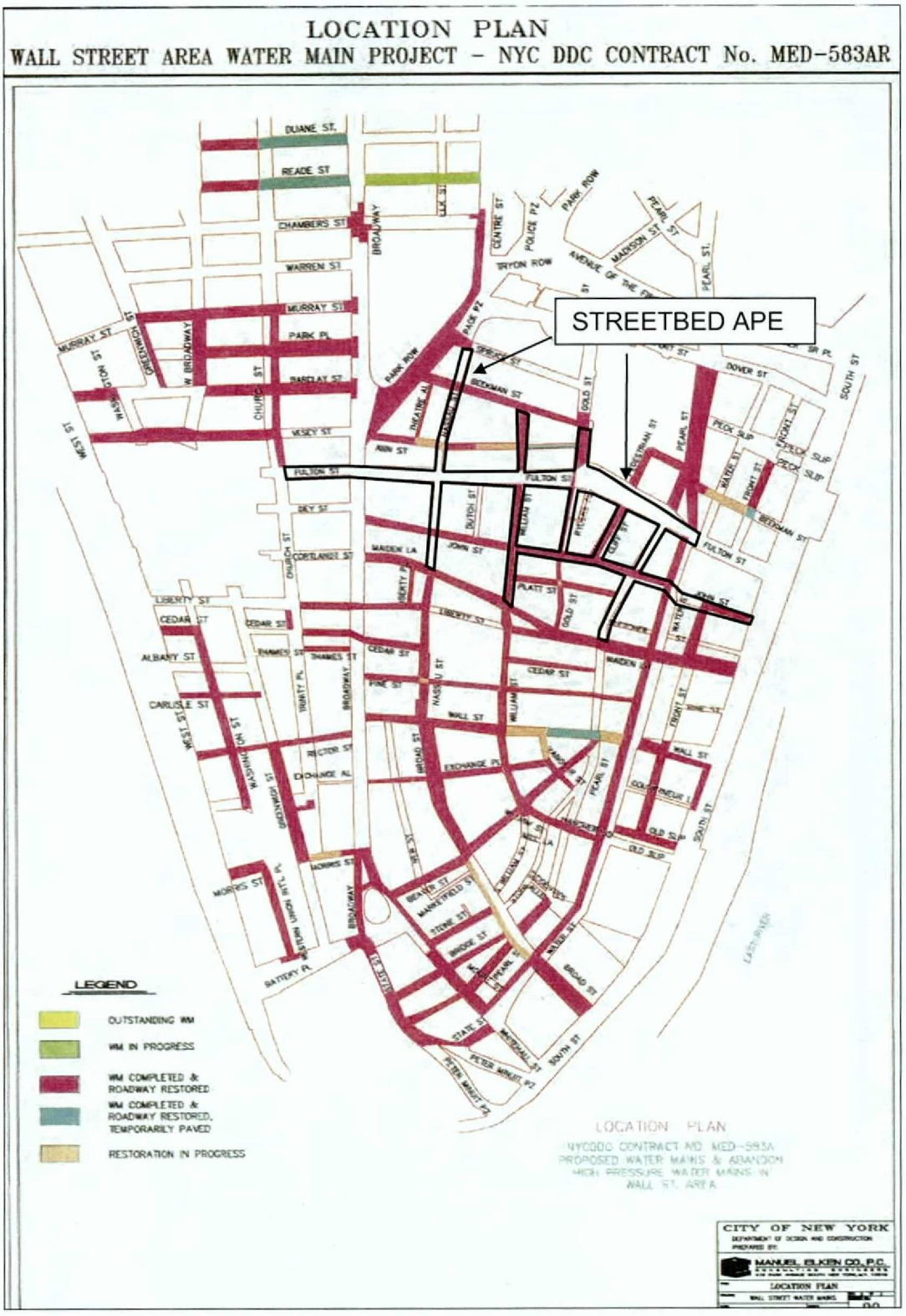


FIGURE 6

Location Plan – Wall Street Area Water Main Project. NYCDDC, July, 2006.

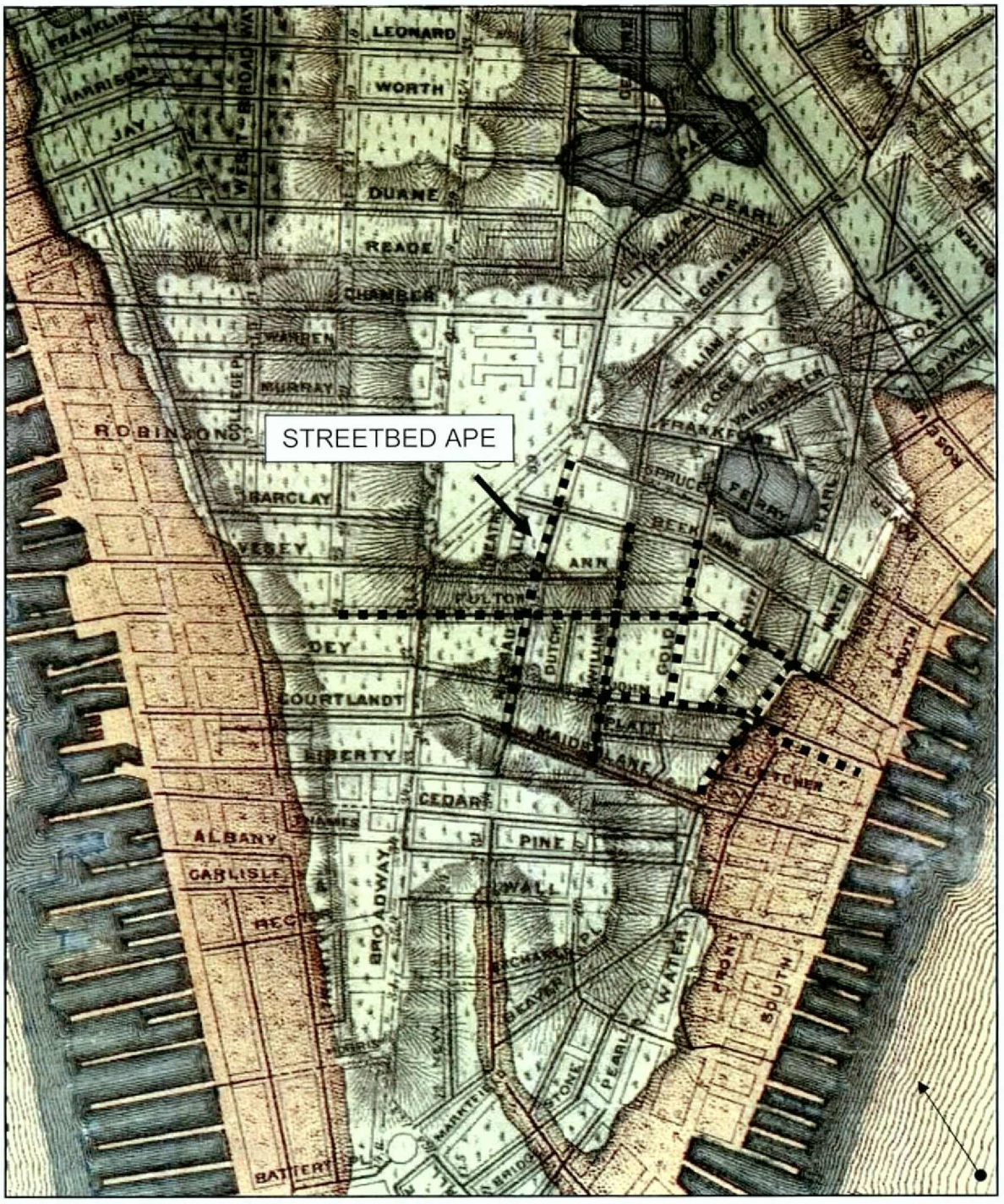


FIGURE 7

Map of the City of New York from the Battery to 80th Street Showing the Original Topography of Manhattan Island. Viele, 1865.

No Scale.

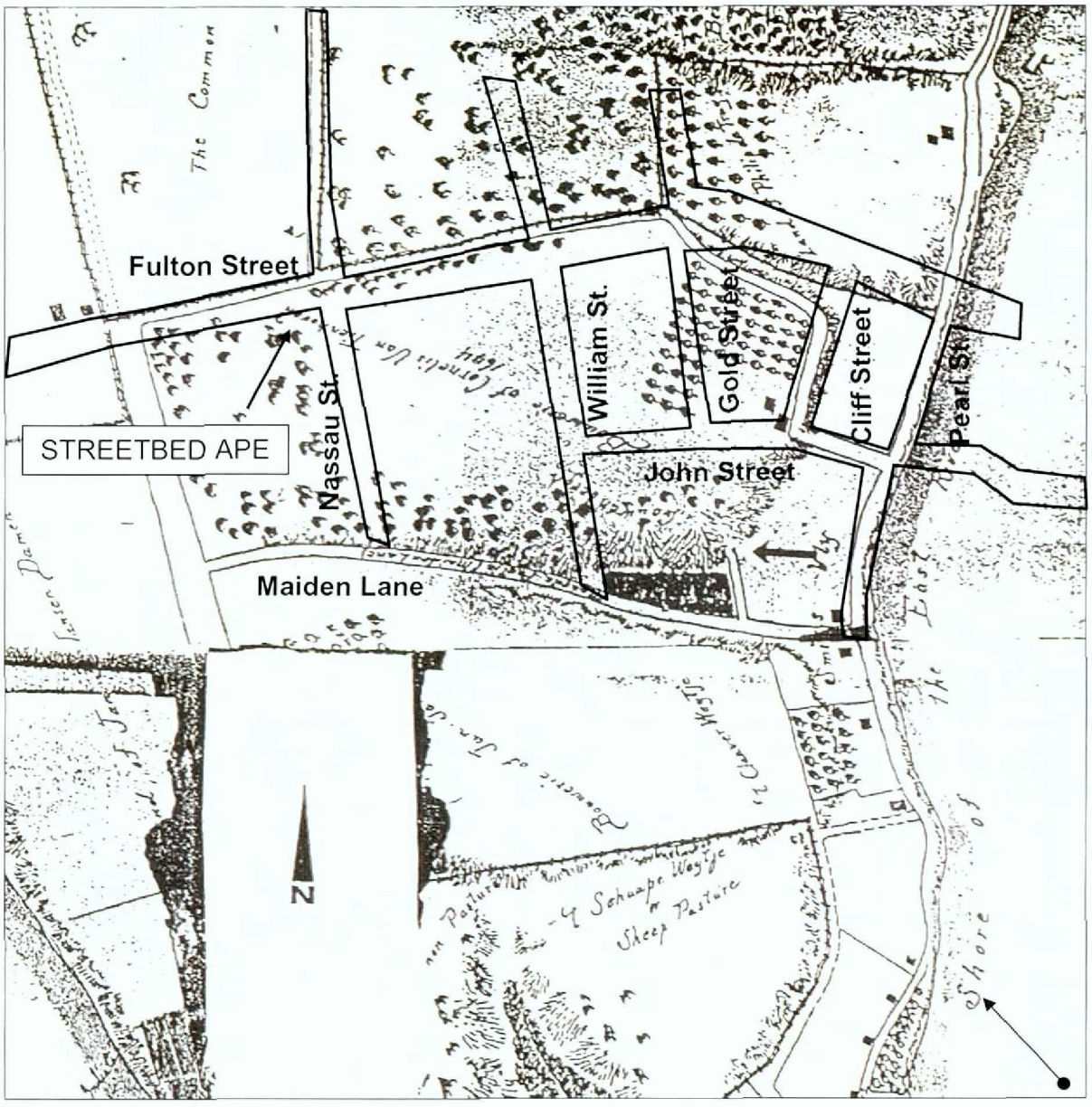


FIGURE 8

Plan of New Amsterdam, About 1644.
Compiled from the Dutch and English Record by J. H. Innes, 1902.

No Scale

Note: Corridor Streetbeds APE Boundaries are Approximate.

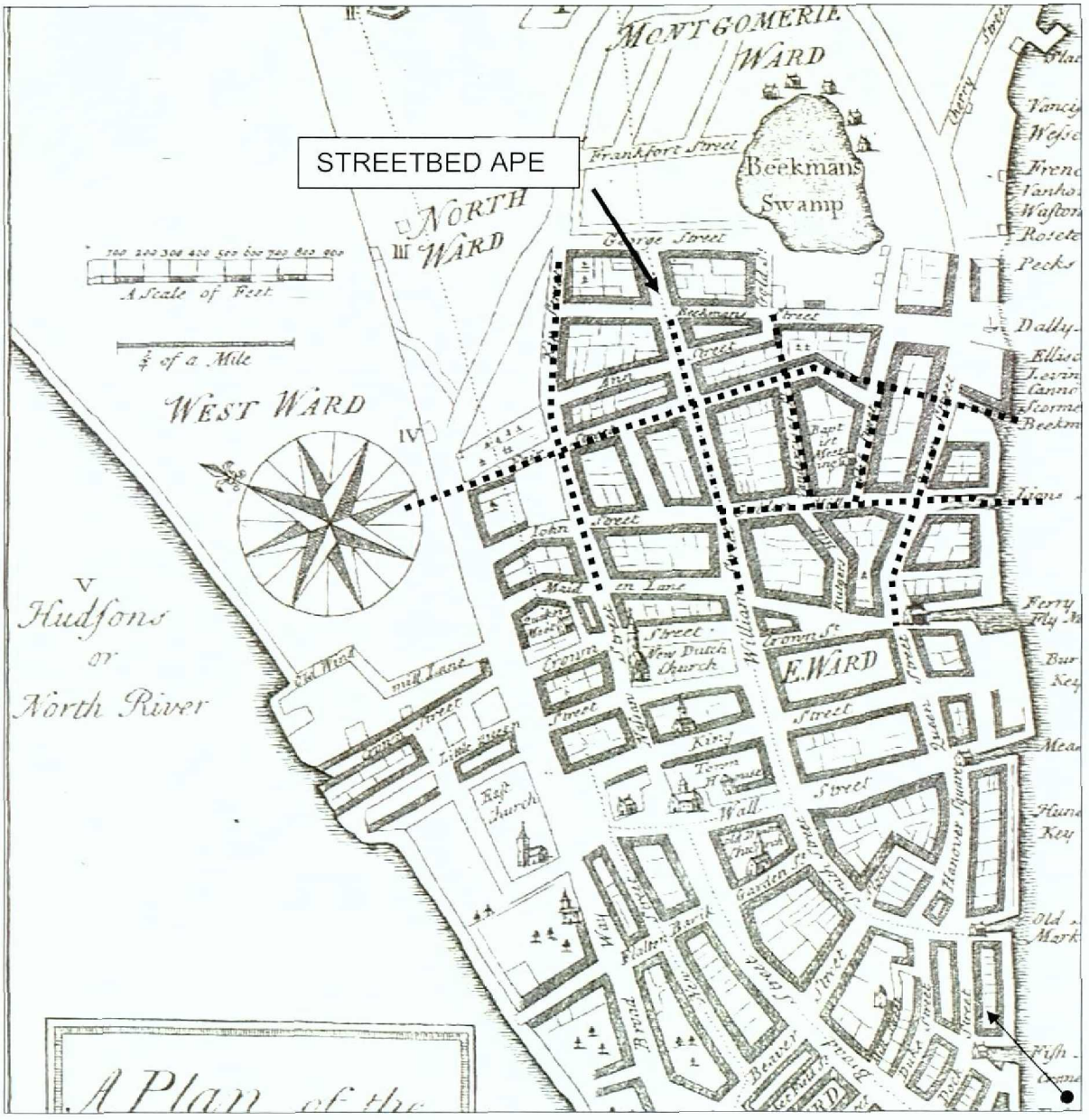


FIGURE 9

A Plan of the City of New York. Carwitham, 1740.
Note: Date Depicted ca.1730.

FIGURE 10

A Plan of the City of New York From an Actual Survey. Lyne, 1730.

FIGURE 11

A Plan of the City and Environs of New York as they were in the years 1742, 1743, and 1744. Grim 1813.

Approximate Scale: 1" = 580'

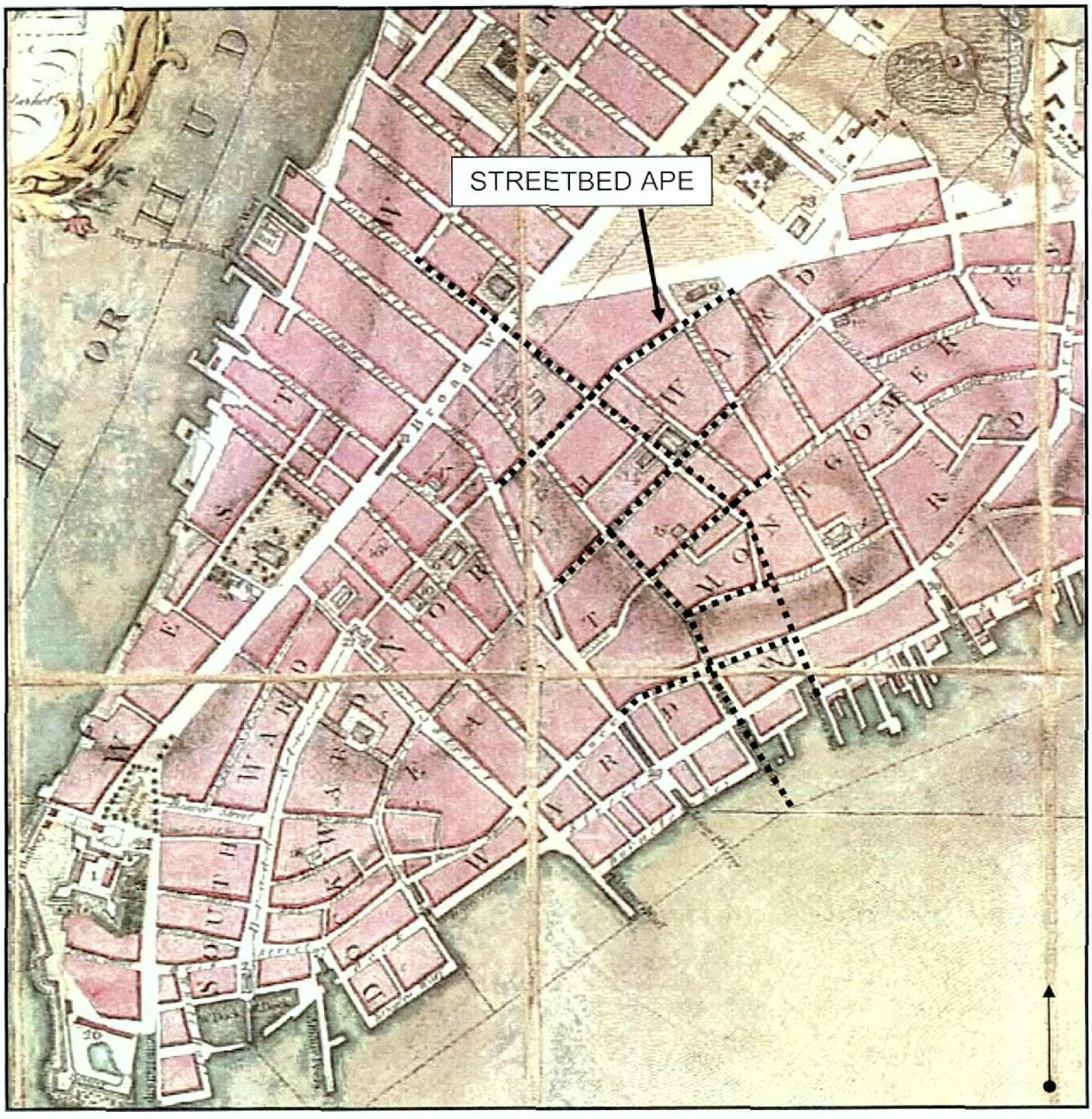


FIGURE 12

Plan of the City of New York. Surveyed in 1767. Ratzer, 1766/67.

Approximate Scale: 1" = 615'

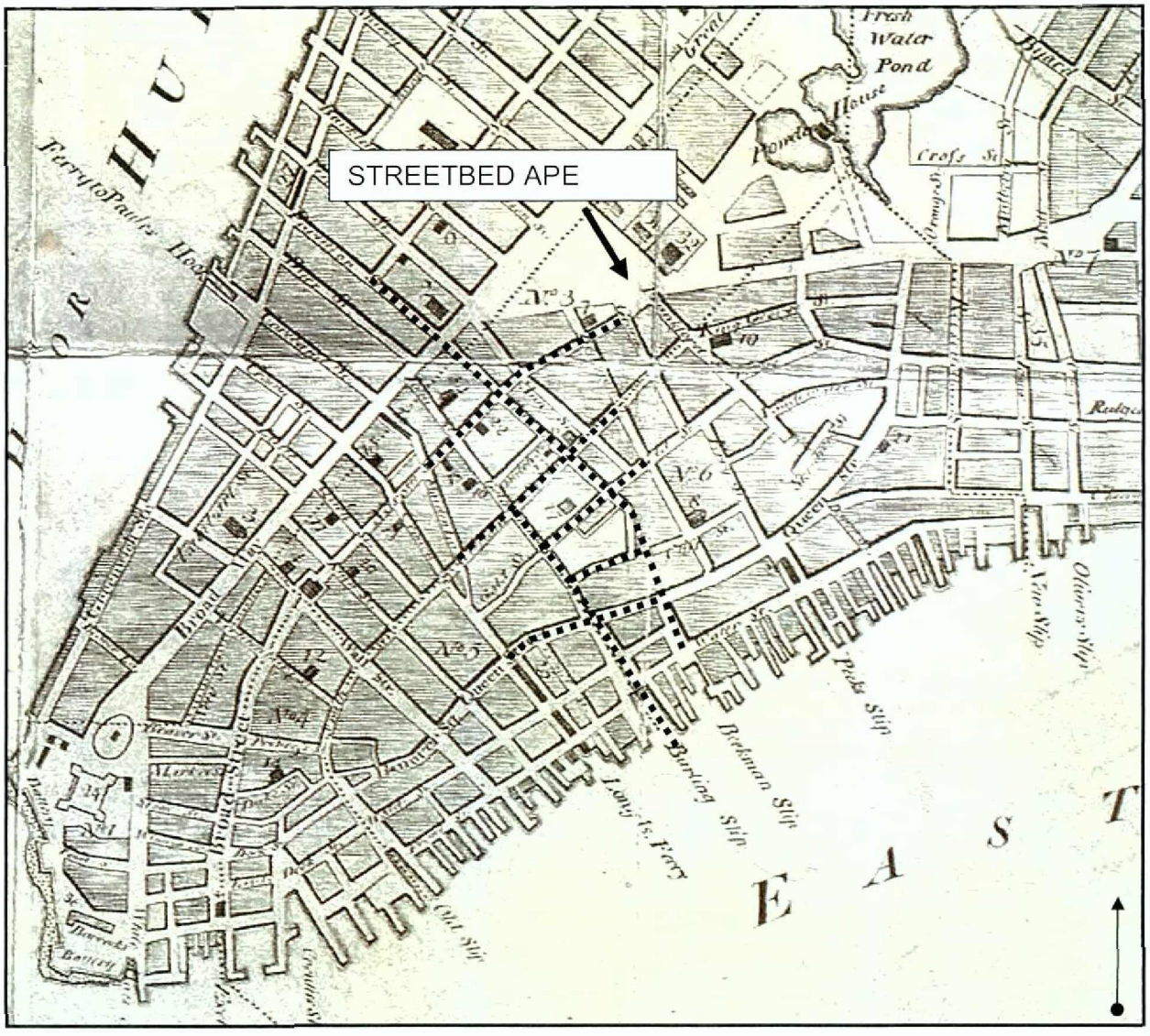


FIGURE 13

The New York Directory and Register for the Year 1789. McComb, 1789.

Approximate Scale: 1" = 860'

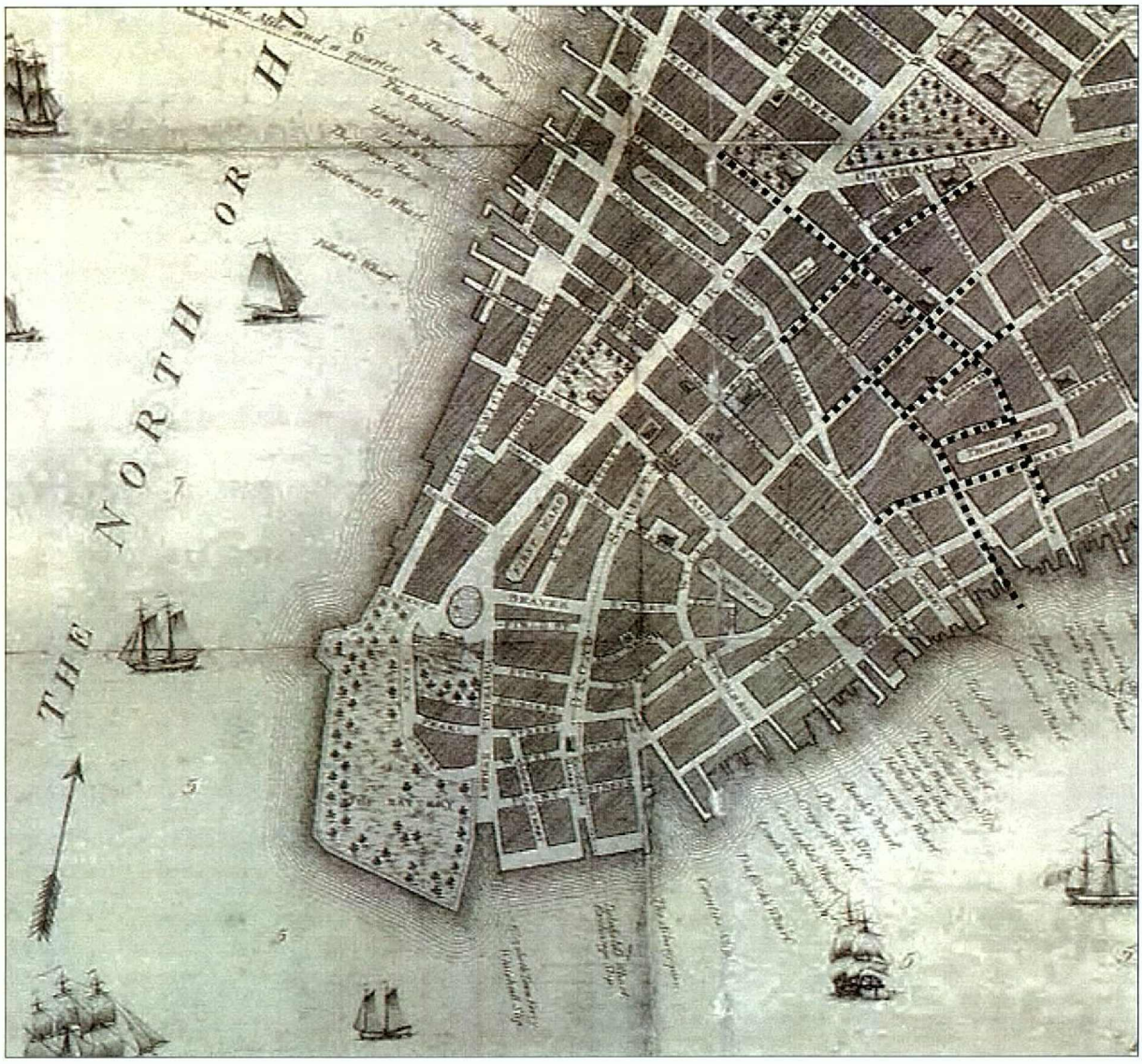


FIGURE 14

A New and Accurate Plan of the City of New York. Taylor-Roberts, 1797.

Approximate Scale: 1" = 860'

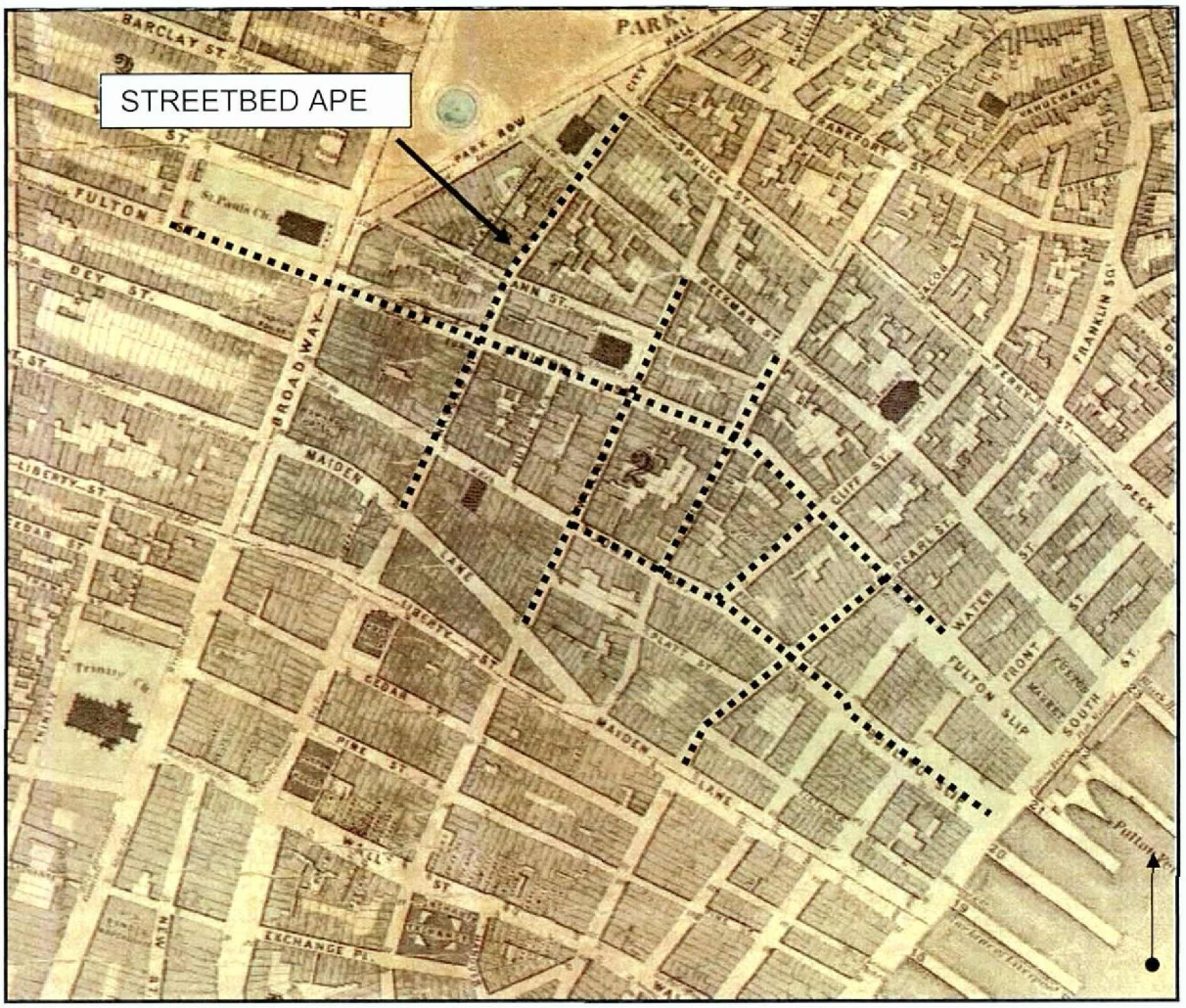


FIGURE 15

Map of the City of New-York Extending Northward to Fiftieth Street.
Dripps, 1852.

Approximate Scale: 1" = 470'

FIGURE 16

Areas of Archaeological Sensitivity Identified for the Fulton Street Transit Center Archaeological APE.
Figure 1B in Berger, 2004.

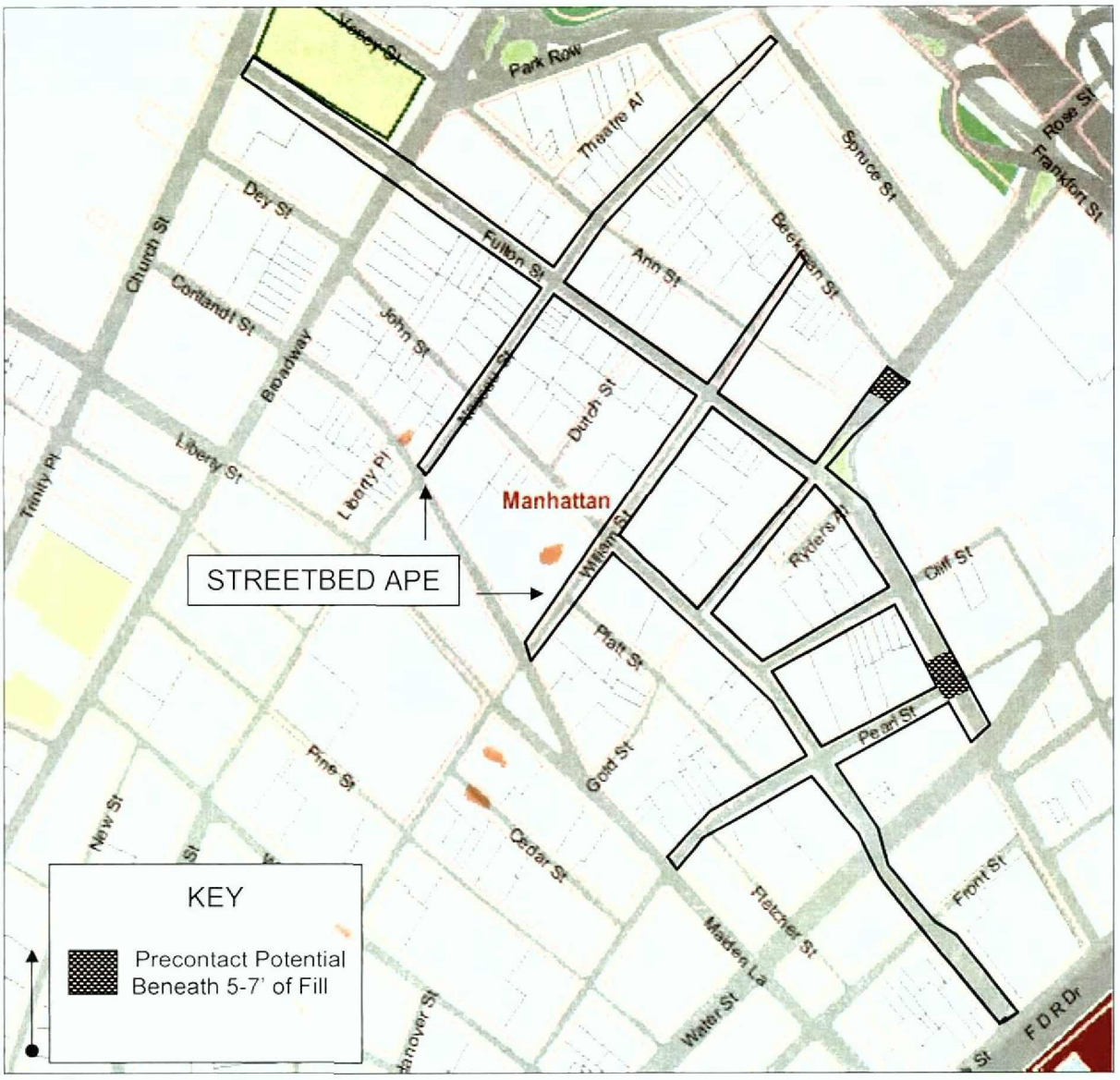


FIGURE 17

Precontact Archaeological Potential, Corridor Streetbeds APE.
Base Map: NYC OASIS, 2007.

Approximate Scale: 1" = 400'

Note: Locations Are Approximate

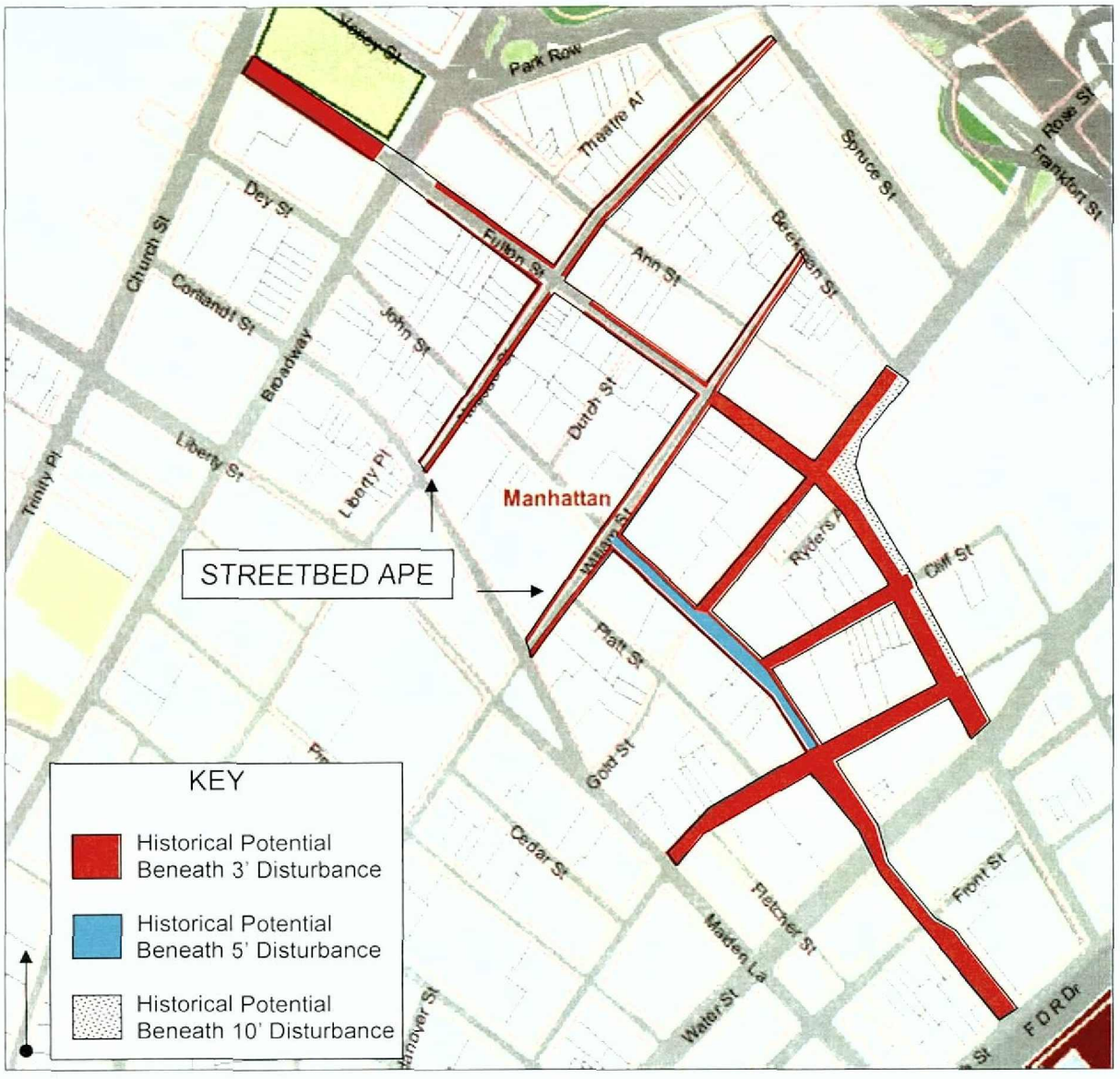


FIGURE 18

Historical Archaeological Potential, Corridor Streetbeds APE.
Base Map: NYC OASIS, 2007.

Approximate Scale: 1" = 400'

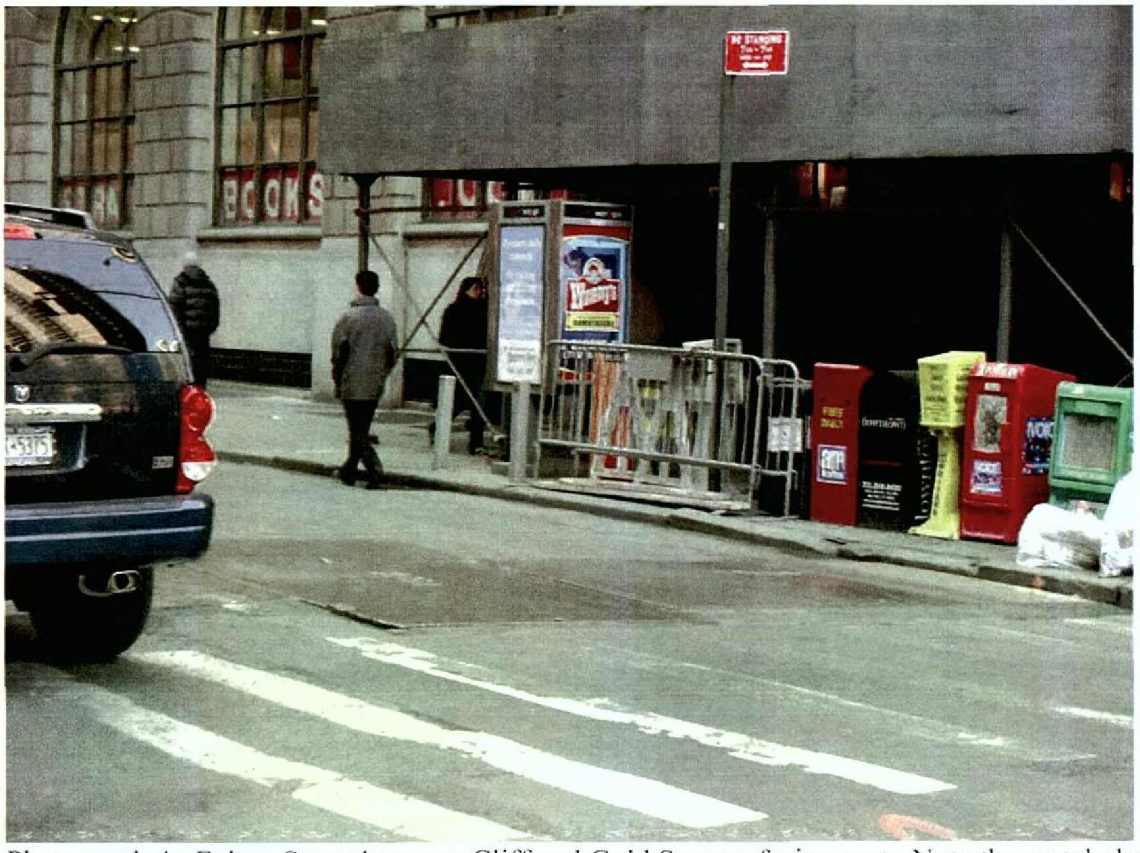
Note: Locations Are Approximate

Photographs

Photograph 1: Fulton Street at Pearl Street, facing east toward the Pearl Street Playground.

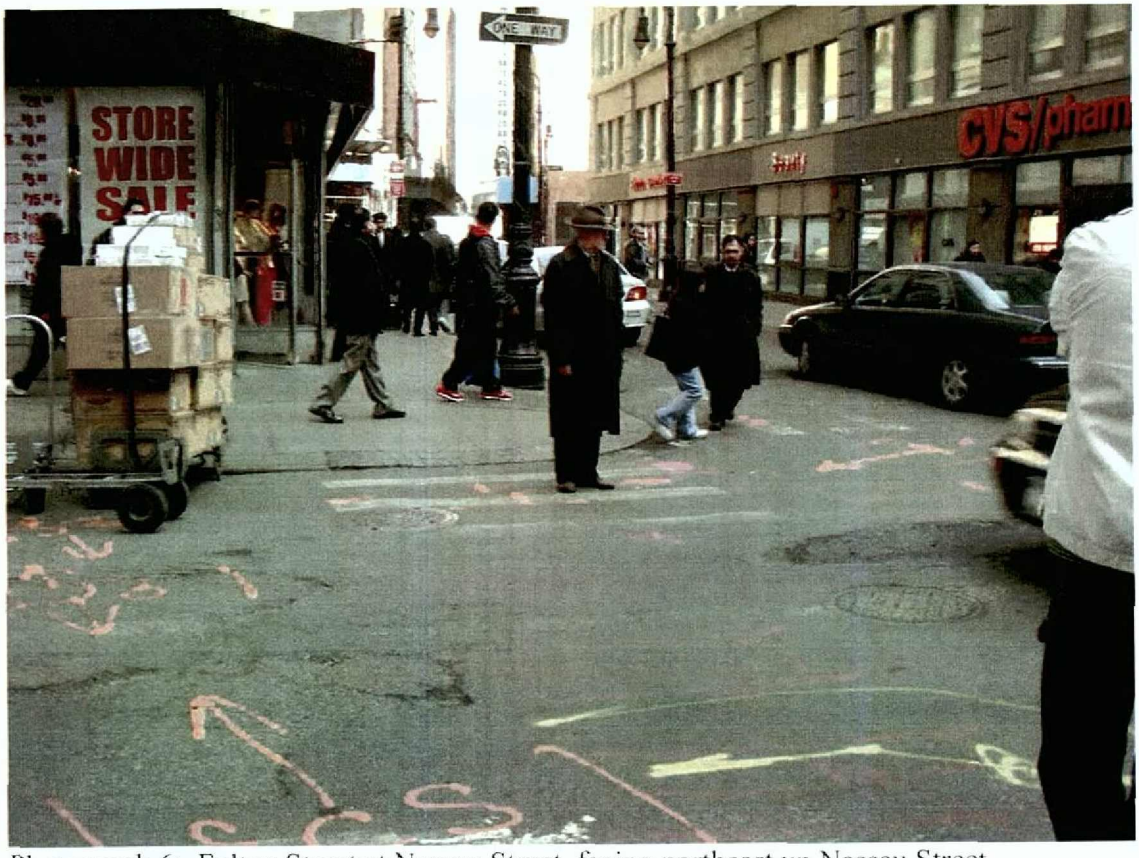
Photograph 2: Fulton Street, facing northeast from the south side of Pearl Street.

Photograph 3: Fulton Street between Pearl and Cliff Streets, facing east. Note the metal plates covering the location of recent utility work it the streetbed.



Photograph 4: Fulton Street between Cliff and Gold Streets, facing east. Note the metal plates covering the location of recent utility work in the streetbed.

Photograph 5: Fulton Street at William Street, facing northeast up William Street.

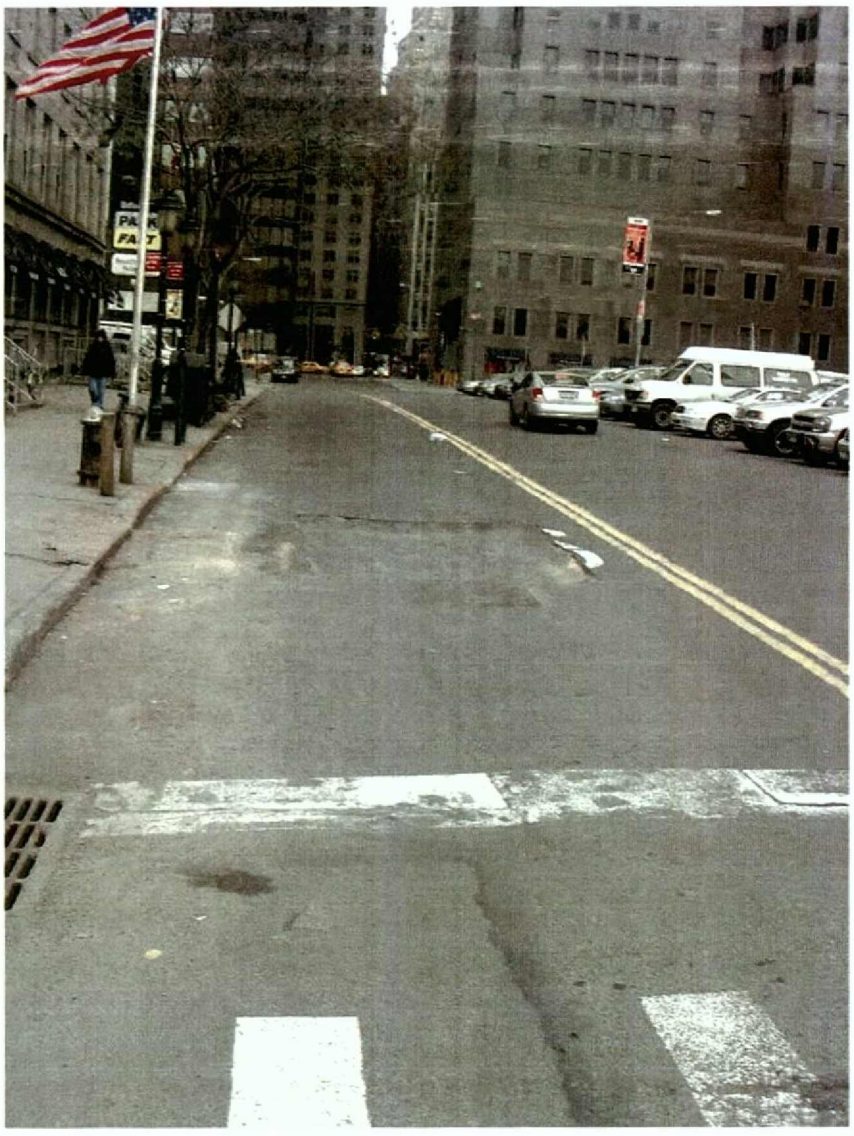


Photograph 6: Fulton Street at Nassau Street, facing northeast up Nassau Street.

Photograph 7: Fulton Street and Broadway intersection, facing northeast up Broadway.

Photograph 8: Fulton Street and Church Street intersection, facing southeast to St. Paul's cemetery.

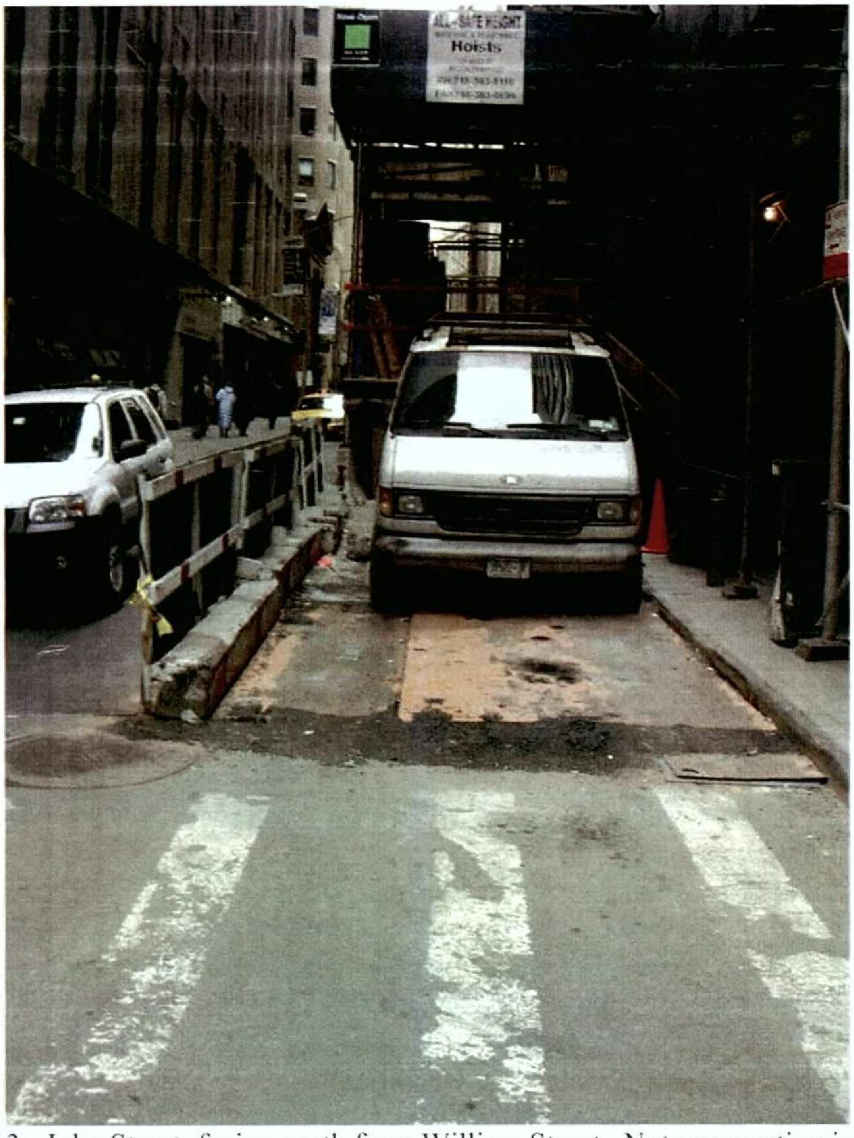
Photograph 9: Construction along west side of Fulton Street, south of Broadway, in connection with the Fulton Street Transit Center project.



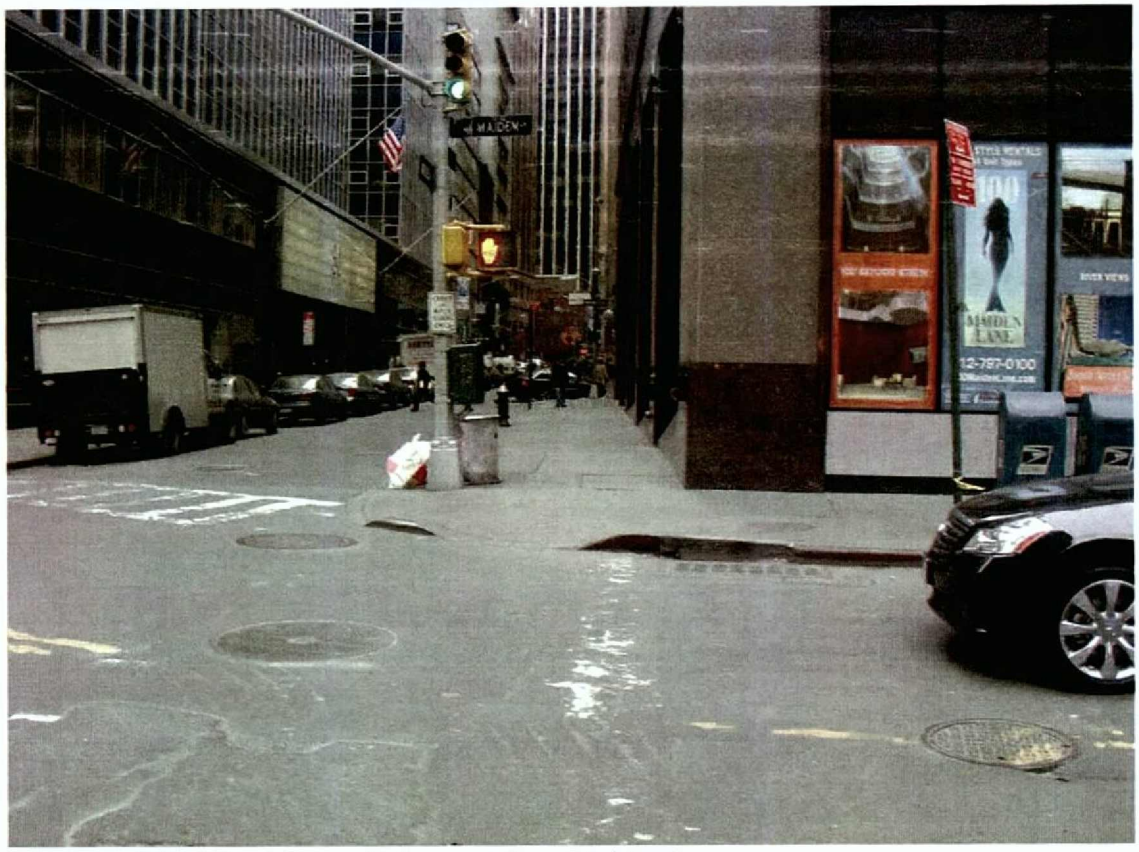
Photograph 10: John Street, facing north up the former route of Burling Slip from South Street.

Photograph 11: John Street, facing northeast from Pearl Street.

Photograph 12: John Street, facing north from Cliff Street.



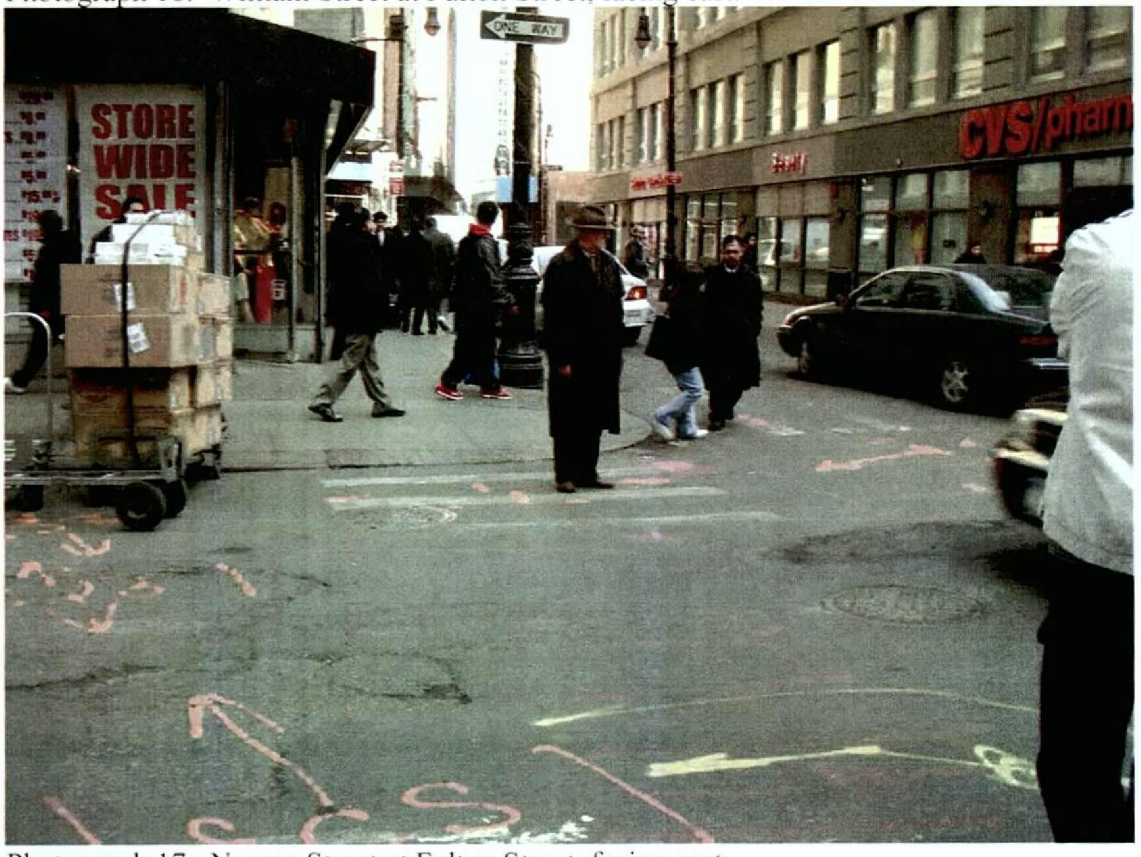
Photograph 13: John Street, facing north from William Street. Note excavating in streetbed.



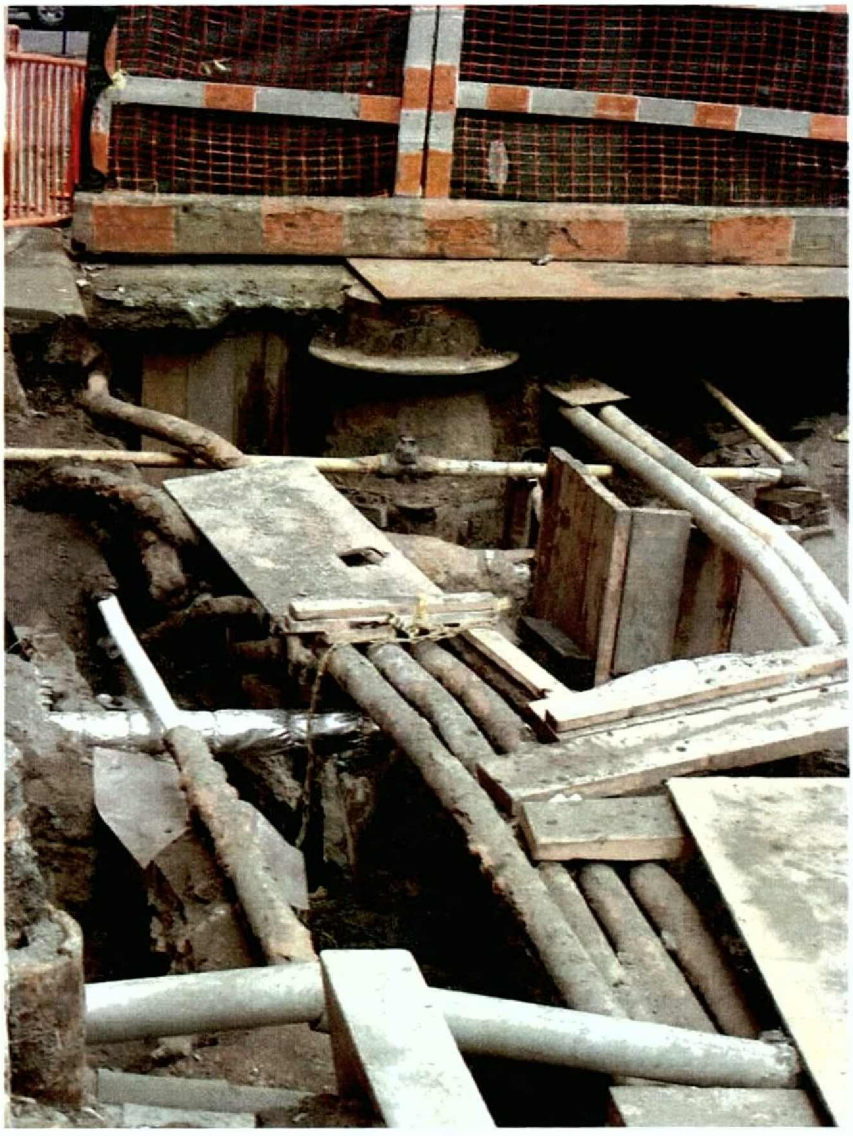
Photograph 14: Pearl Street facing east from Maiden Lane.

Photograph 15: Cliff Street at John Street, facing east.

Photograph 16: William Street at Fulton Street, facing east.



Photograph 17: Nassau Street at Fulton Street, facing east.



Photograph 18: Utility work in Platt Street within 20' of Pearl Street, immediately out of APE. Note the extensive network of underground utility pipes and structures, and the extent of excavation around them.